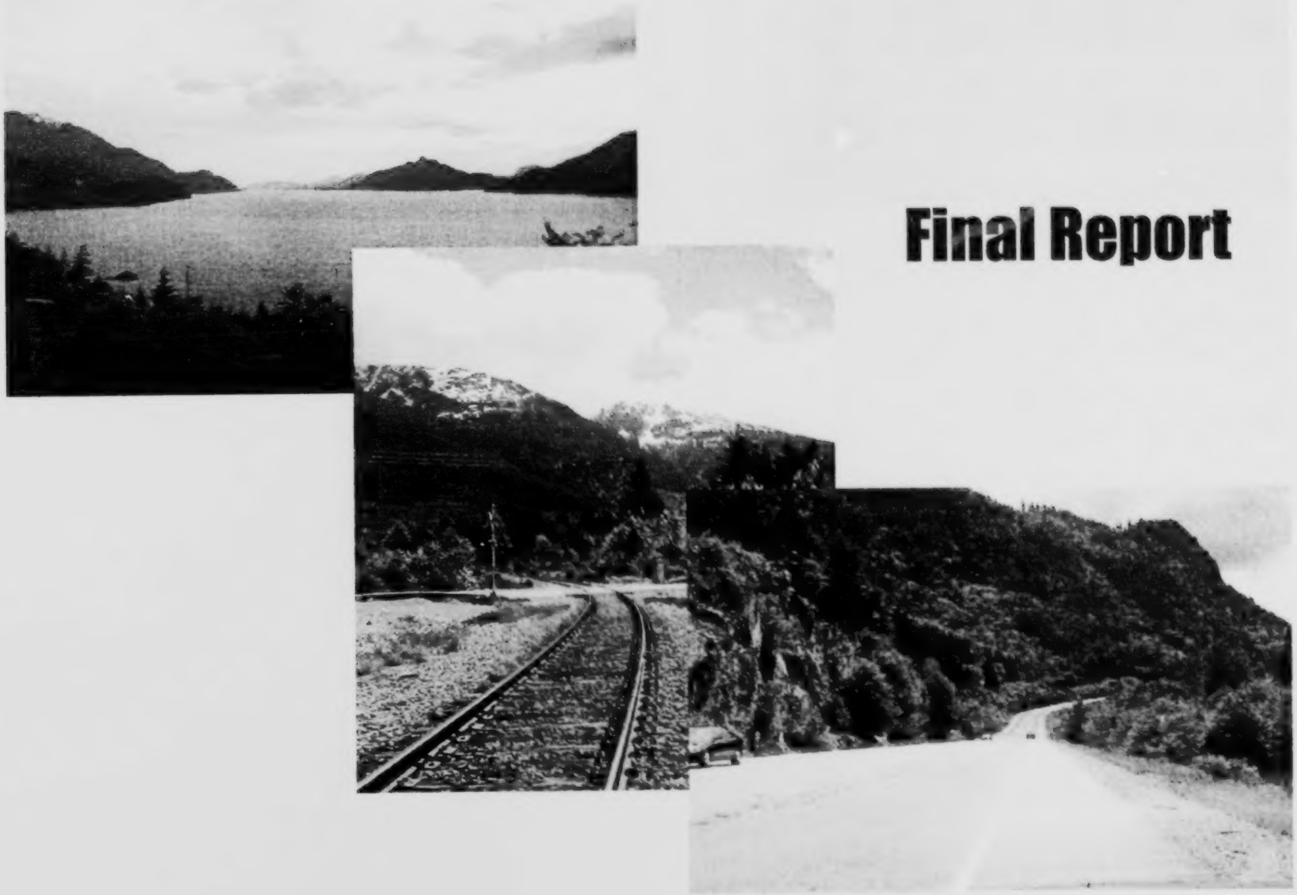
Sea-to-Sky Corridor Travel Demand Study



Final Report

January 2002

TSi consultants in association with &mustel

Prepared for:

- ☐ West Coast Express
- ☐ BC Ministry of Transportation
- ☐ BC Rail
- ☐ Resort Municipality of Whistler
- ☐ Transport Canada
- ☐ TransLink

Prepared by:

TSi Consultants

318 – 4190 Lougheed Hwy
Burnaby, BC V5C 6A8 Canada

Tel: 604-293-2882
Fax: 604-293-2892

Website: www.tsigroup.ca

In Association with

McIntyre & Mustel

and:
- ☐ Bruce McKeown
- ☐ Cansult
- ☐ Mobility Solutions
- ☐ Urban Futures

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Executive Summary

Introduction

The Sea-to-Sky corridor is located in one of the most spectacular settings in the world. From Horseshoe Bay and extending north to Whistler, travellers on Highway 99 North are treated to an uninterrupted vista of Howe Sound, year-round glaciers and breath-taking West Coast mountain scenery. The popularity of the corridor and the success of the destinations along the corridor have grown such that the highest daily traffic volumes now occur in the summer months. This is a remarkable fact considering that traditional users of the Sea-to-Sky corridor are travellers headed to winter alpine sport destinations.

In addition to the automobile, travelers can access the corridor by scheduled or chartered bus services, a limited passenger rail service, or a seasonal tourist ferry. Given the growth in corridor traffic volumes and highway safety concerns, previous studies have examined multi-modal alternatives that would improve the corridor's performance. Up to now, studies have focused on the supply side, while information on travel demand has been somewhat limited.

Study Objective

The objective of this study is to estimate the long-term demand for rail and other multi-modal services on the Sea-to-Sky corridor up to 2025. In addition, the study identifies feasible opportunities that could be operational by 2010. The Sea-to-Sky corridor is defined in this study as the urban and rural areas adjacent to Highway 99 North between Horseshoe Bay and Whistler, B.C.

The key tasks undertaken for this study included:

- selection and refinement of feasible corridor options;
- current demand assessment and market research
- model development, demand forecasting and option evaluation

Sea-to-Sky Corridor Options

Four corridor options were developed and selected for demand forecasting and evaluation. These options provided the range of possible multi-modal improvements for the Sea-to-Sky corridor and are defined as follows:

- **Option 1 – Highway Emphasis** included the four laning of Highway 99 North between Horseshoe Bay and Squamish and safety and urban improvements for the entire corridor to Whistler. This option also includes minimum rail investments (e.g. new or refurbished rolling stock and upgrade of level crossings). The capital cost for this option is estimated at $996 million, with an annual operating cost of $0.85 million.

- ☐ **Option 2 – Medium Rail Investment** entailed increased rolling stock and service frequency for the passenger rail between Lonsdale Quay and Whistler (three northbound and three southbound trips daily). Train passenger fares between North Vancouver and Squamish would be $25 one-way and $50 one-way to Whistler. This option also included highway safety and urban improvements identified in Option 1. The capital cost is estimated at $524 million, with an annual operating cost of $23 million.
- ☐ **Option 3 – Maximum Rail Investment** would result in the reduction of line-haul travel time by as much as 25 minutes while offering identical passenger service frequencies as Option 2. Train passenger fares between North Vancouver and Squamish would be $35 one-way and $70 one-way to Whistler. This option also included highway safety and urban improvements identified in Option 1. The capital cost is estimated at $774 million, with an annual operating cost of $23 million.
- ☐ **Option 4 – Passenger-Only Ferry/Bus** included a new passenger-only ferry service between Central Waterfront and Squamish, and bus connection up to Whistler (four northbound and four southbound trips daily). Ferry/Bus passenger fares between Vancouver and Squamish would be $25 one-way and $35 one-way to Whistler. This option also included highway safety improvements and minimum rail upgrades. The total capital cost for this option is estimated at $271.3 million, with annual operating costs of $7.45 million.

Existing Corridor Demand

Current inter-city corridor demand was estimated using a combination of existing information and original surveys conducted for this study. Two marketing research studies were completed to assess current demand levels and consumer interest in the proposed options. The first survey involved telephone interviews with 900 residents of the Sea-to-Sky corridor and Lower Mainland. An on-site survey at Whistler was also completed with 200 non-residents to determine their travel characteristics and responsiveness to the corridor options. Additionally, a survey of bus companies operating in the corridor was conducted in order to estimate inter-city bus movements and ridership.

On the bases of market research and existing information, the current inter-city corridor demand was estimated at approximately 11 million trips per year. Residents of the corridor and Lower Mainland account for approximately 83 percent of the total travel demand. The remaining 17 percent of travel is made by non-residents (e.g. Rest of B.C., Canada and International). Auto demand (drivers and passengers) accounts for 93 percent of total inter-city demand. Bus and rail passengers account for six percent and less than one percent of travel demand, respectively.

Other features of the corridor demand include:

- Corridor residents account for approximately 35 percent of the inter-city demand, while comprising of only one percent of the population of the study area (defined as the Sea-to-Sky corridor and the Lower Mainland).
- Whistler attracts 55 percent of the corridor destinations, while Squamish attracts 15 percent of the destinations.
- Sixty-five percent of the non-resident visitors to Whistler arrived by airplane in Vancouver, and the majority of them spent time in the Lower Mainland prior to travelling to Whistler.
- Washington and Oregon visitors who drive across the border represent 20 percent of the total non-resident demand.

Baseline Demand Forecasts

A 24-hour inter-city EMME/2 demand forecasting model was developed to estimate 2010 and 2025 demand for the four corridor options. The following market segments are explicitly defined in the model: (i) resident commuting/business; (ii) resident recreational/social; (iii) resident shopping/personal business; and (iv) non-residents (e.g. rest of B.C., Canada and International). Demographic forecasts were developed for residents and non-residents as a basis for estimating horizon year travel demand. Mode diversion and latent demand estimation techniques were based upon results from the market research surveys.

Under baseline conditions, total inter-city corridor travel is forecast to increase from the current level of 11 million to 13 million in 2010 (20 percent increase) and 17 million by 2025 (55 percent increase). Average Annual Daily Traffic (AADT) volumes between Horseshoe Bay and Squamish are forecast to increase from approximately 10,800 to 16,300 by 2025 (50 percent increase). Between Squamish and Whistler, AADT is expected to increase from approximately 7,700 to 11,200 by 2025 (45 percent increase).

Bus travel is estimated to increase from the current annual level of 0.7 million to 1.25 million in 2025 (80 percent increase). This can be attributed to the higher growth rate associated with non-resident travel. Rail is also forecast to increase at similar rates, but will still only capture less than one percent of total corridor demand.

Option Evaluation

Travel forecasts for the four options were developed using the EMME/2 demand forecasting model. Capital and operating/maintenance costs were provided for each option. A high level evaluation was undertaken to compare the costs of each option with the resulting travel time benefits. Additionally, information on the cost per trip was developed for each option by travel mode. This information isolates the various components of the options and helps to assess their merits as standalone projects.

On the basis of travel time benefits alone, the options do not appear to justify their costs. However, accident costs savings have not been estimated for this study and they could have a significant impact on the benefits associated with each option. Also, it is not evident that any of the multi-modal options evaluated would divert significant vehicle demand from Highway 99 North. It is important to note, however, that the analyses assumed no new transportation demand management (TDM) initiatives would be in place in the study area.

Increased bus service was not evaluated as part of this study. However, it became evident during the review of existing demand profiles and the option analysis that increased bus service has potential to divert a portion of vehicle demand from Highway 99 North.

The following summarizes the specific findings for each option:

Option 1 – Highway Emphasis
Vehicle demand on Highway 99 North is expected to increase by six to seven percent over baseline estimates for 2010 and 2025. This is primarily due to the release of latent demand (e.g. trips that would not be made without the improvement) and to a lesser extent diversion from transit.

The average annual net cost for this option is estimated at $74.4 million, and annual travel benefits are estimated at approximately $37.4 million (50 percent of the annual net costs). Note that accident cost savings have not been included in this analysis and could exceed the travel time benefits. The average cost per trip for auto and bus passengers is estimated at $5 in 2010 and $3.9 in 2025 (assuming the cost is shared according to person trips and not vehicle trips).

This option also included minimum rail improvements, which are estimated to cost more than $100 per passenger in 2010, decreasing to approximately $70 per passenger in 2025.

Option 2 - Medium Rail and Option 3 - Maximum Rail Investment
Rail passenger demand is estimated at approximately 200,000 trips per year by 2025 for both options. Although the maximum rail option results in a 25 minute travel time savings between North Vancouver and Whistler, it appears that the higher fare levels offset any increases in train passenger demand. Average daily passenger trips are estimated at approximately 400 in 2010 and 550 in 2025. Assuming six trains per day (three each way), this translates to average loadings of 65 and 90 passengers per train.

The travel time benefits for both options are approximately 10 percent of the average annual net costs. The average cost per trip for train passengers ranges between $265 and $490, depending on the option and time horizon. These unit costs are much higher than the proposed fares of $50 and $70 between North Vancouver and Whistler. This indicates that significant public subsidies would be required for both options. It is evident that the rail options are not viable alternatives for servicing long-term demand in the corridor.

These options also included highway safety upgrades, which are estimated to cost approximately $1 per trip for auto and bus passengers ($1.1 in 2010 and $0.9 in 2025).

Option 4 – Passenger-Only Ferry/Bus

The passenger-only ferry/bus option is estimated to produce approximately 550,000 annual trips by 2025, or 1,500 daily one-way trips. Assuming eight sailings per day (four each way), this translates to an average passenger loading of approximately 190. Note that if this service was to be operational in the short-term, passenger demand is estimated at between 300,000 and 400,000 trips per year.

This option has the lowest annual cost and the highest fare revenue potential, resulting in an average net annual cost of $13.9 million. The annual travel benefits estimated for this option are estimated at $6.9 million, or approximately 50 percent of the average annual net costs. Based upon the fare structure proposed for this option (e.g. $25 between Vancouver and Squamish), it appears that this service could cover its costs at some point in the future. The introduction of reduced commuter fares was not evaluated and would likely stimulate additional demand for this service. It is evident that the ferry service may offer potential as an independent service, but does not divert significant demand from Highway 99 North.

This option also included highway safety improvements and minimum rail investments. The average cost per trip for auto and bus passengers would be $1 to cover the annualized costs of the highway upgrades. The average cost per trip for train passengers is estimated at more than $100 in 2010 to cover the annualized rail costs.

Conclusions

The key conclusions drawn from the study are:

- ☐ The multi-modal options tested do not appear to divert significant demand from Highway 99 North. Note that this analysis assumed status quo TDM measures and no highway tolling within the study area.
- ☐ Market research results indicate that an enhanced bus service concept may offer potential to divert some automobile traffic from Highway 99 North.
- ☐ The passenger-only ferry service may offer potential as an independent service.
- ☐ The medium and maximum rail options tested for this study are not viable alternatives for servicing long-term demand in the Sea-to-Sky corridor.

Additional planning and detailed analysis would be required if further consideration is given to any of these options.

1. Introduction

1.1 Background

The Sea-to-Sky corridor is located in one of the most spectacular settings in the world. From Horseshoe Bay and extending north to Whistler, travellers on Highway 99 North are treated to an uninterrupted vista of Howe Sound, year-round glaciers and breath-taking West Coast mountain scenery. The popularity of the corridor and the success of the destinations along the corridor have grown such that the highest daily traffic volumes now occur in the summer months. This is a remarkable fact considering that traditional users of the Sea-to-Sky corridor are travellers headed to winter alpine sport destinations.

In addition to the automobile, passengers can choose to travel by scheduled or chartered bus services, a limited passenger rail service, or a seasonal tourist ferry. Given the growth in corridor traffic volumes and highway safety concerns, previous studies have examined multi-modal alternatives that would improve the corridor's performance. Up to now, studies have focused on the supply side, while information on travel demand has been fairly limited.

1.2 Study Objective

The objective of this study is to estimate the long-term demand for rail and other multi-modal services on the Sea-to-Sky corridor up to 2025, and to identify feasible opportunities that could be operational by 2010. Exhibit 1.1 illustrates the major activities undertaken for this study, which included:

- ☐ selection and refinement of feasible corridor options;
- ☐ demand assessment and market research
- ☐ model development and option forecasting and evaluation

The Sea-to-Sky corridor is identified in this study as the urban and rural areas adjacent to Highway 99 North between Horseshoe Bay and Whistler, B.C. Exhibit 1.2 provides a map highlighting the communities and activity centres along the corridor.

This report is organized in six sections. Section 2 provides the description of the corridor options, capital cost estimates and operating characteristics. Section 3 summarizes the major surveys and research efforts completed for the study. Section 4 describes the travel demand model development procedures and results. Section 5 presents the corridor forecasts and the evaluation of the corridor options. Conclusions and recommendations are presented in Section 6.

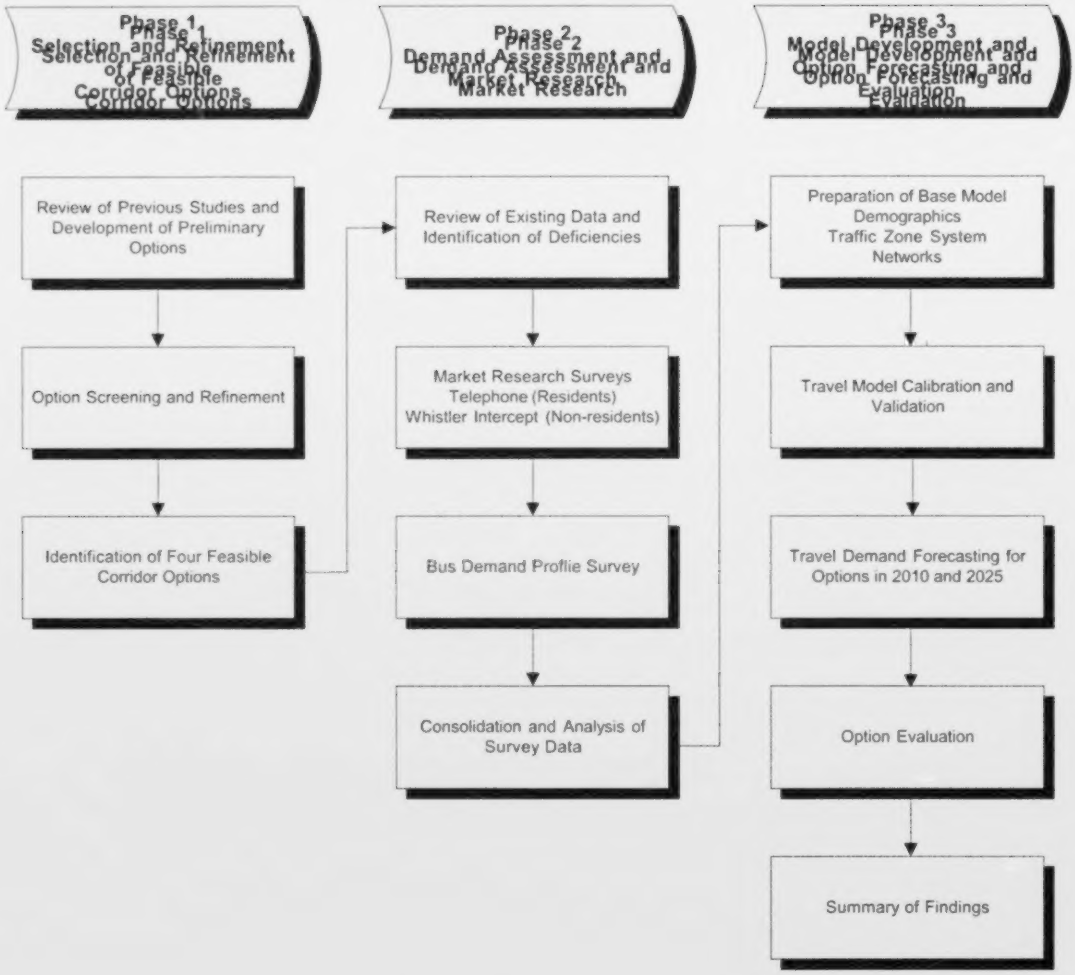
Phase 1
Selection and Refinement of Feasible Corridor Options
Phase 2
Demand Assessment and Market Research
Phase 3
Model Development and Option Forecasting and Evaluation
Review of Previous Studies and Development of Preliminary Options
Option Screening and Refinement
Identification of Four Feasible Corridor Options
Review of Existing Data and Identification of Deficiencies
Market Research Surveys
Telephone (Residents)
Whistler Intercept (Non-residents)
Bus Demand Proflie Survey
Consolidation and Analysis of Survey Data
Preparation of Base Model
Demographics
Traffic Zone System
Networks
Travel Model Calibration and Validation
Travel Demand Forecasting for Options in 2010 and 2025
Option Evaluation
Summary of Findings

Exhibit 1.1 – Study Flow Diagram

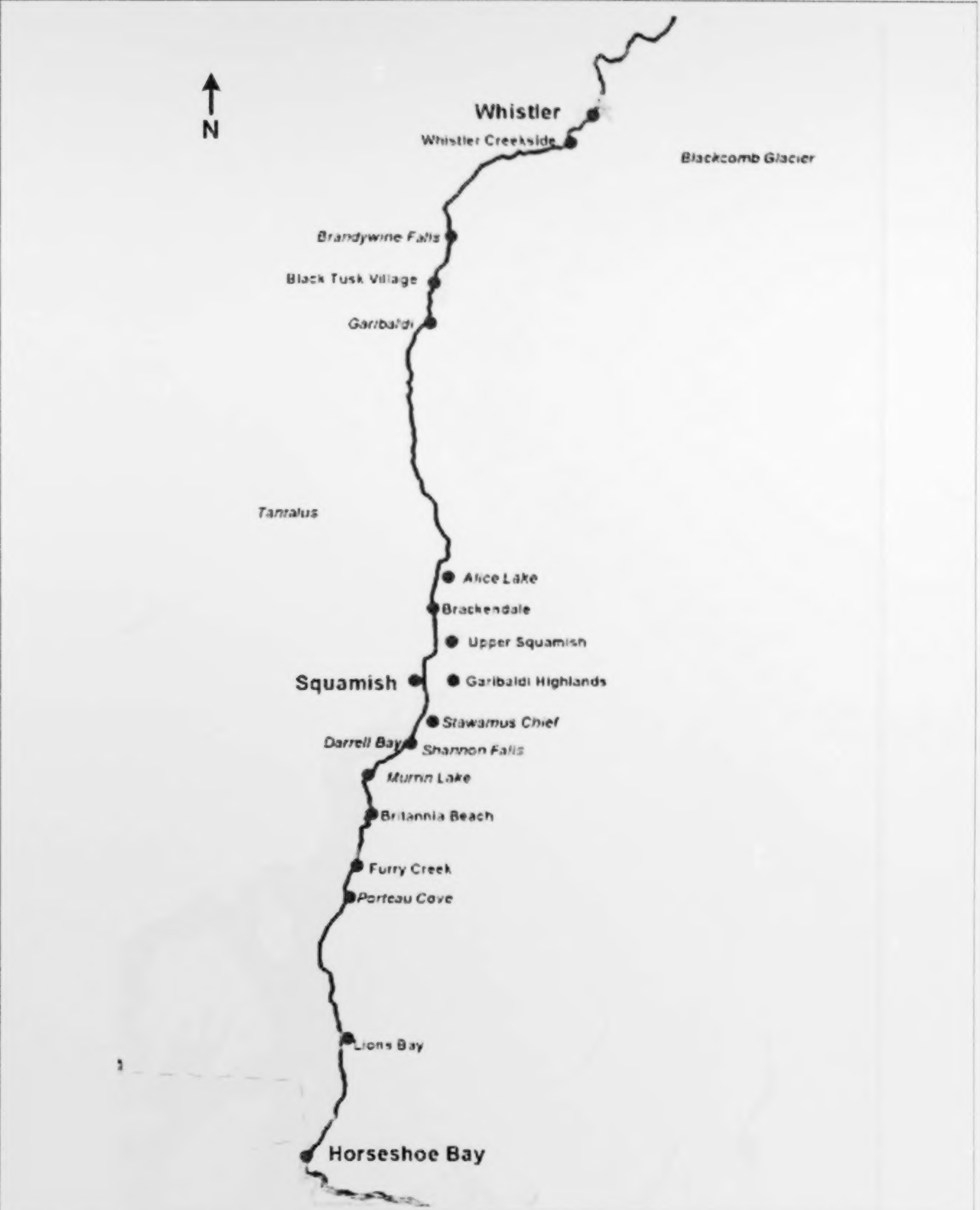
N
Whistler
Whistler Creekside
Blackcomb Glacier
Brandywine Falls
Black Tusk Village
Garibaldi
Tantalus
Alice Lake
Brackendale
Upper Squamish
Squamish
Garibaldi Highlands
Stawamus Chief
Darrell Bay
Shannon Falls
Murrin Lake
Britannia Beach
Furry Creek
Porteau Cove
Lions Bay
Horseshoe Bay

Exhibit 1.2 – Study Area

2. Sea-to-Sky Corridor Options

One of the first activities undertaken was a review of corridor options developed from previous studies. Based on this review, four multi-modal options were developed for detailed market demand analysis and evaluation. This section provides a summary of the option development and description of the operating characteristics and costs for each of the feasible options.

2.1 Option Development

A comprehensive review of various supply concepts for the Sea-to-Sky corridor was completed for the Ministry of Transportation in 2001[1]. A key result of this study was the development of a comprehensive list of supply scenarios grouped into the following categories:

- ☐ Constrained Mobility
- ☐ Highway Mobility
- ☐ Multi-Modal Mobility

Three modal emphases were also developed to complement the supply scenarios: i) automobile/bus, ii) bus, and iii) rail. According to the initial review of the study, the marine mode involving passenger ferry was deleted from consideration due to poor peak period capacity performance compared to rail, operational difficulties and negative response from elected officials.

For the current study, feasible corridor options were identified using information from previous studies. After a Steering Committee review the following four corridor options were selected for detailed evaluation:

Option 1 – Highway Emphasis with four lanes between Horseshoe Bay and Squamish and two lanes between Squamish and Whistler.

Option 2 – Medium Rail Investment with increased passenger service frequency but no reduction in travel time from present train service.

Option 3 – Maximum Rail Investment with similar passenger service as Option 2 and a 15-minute reduction in total travel time.

Option 4 – Passenger-Only Ferry/Bus with passenger-only ferry service between the Vancouver Central Waterfront and Squamish, and bus connection between Squamish and Whistler.

2.2 Option Description

Information on operational characteristics and costs for the four corridor options are presented below. Operational characteristics, including travel time, access time, and associated travel costs for existing conditions and the corridor options between Vancouver and Squamish, and Vancouver and Whistler are summarized in Exhibit 2.1 and Exhibit 2.2.

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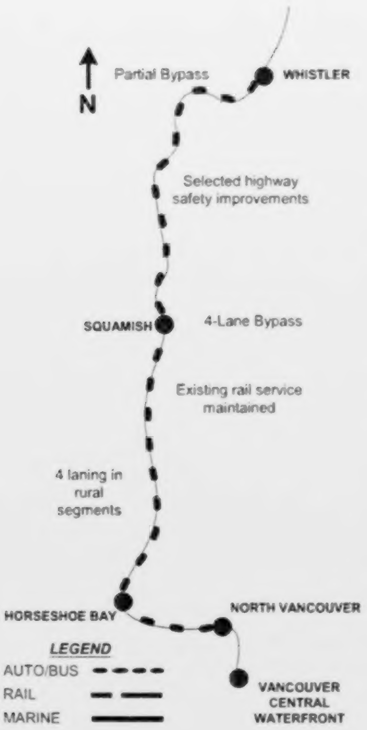
[1] Reid Crowther & Partners Ltd., Multi-Modal Corridor Transportation Study: Horseshoe Bay to Highway 97, BC Ministry of Transportation and Highways, March 2001.

Current and future auto times assume travel during peak periods and are based on information from the Reid Crowther study and the TransLink Regional Travel Model. Current bus and rail travel times represent the average scheduled time in both directions. Wait times reflect the typical time a passenger will arrive in advance of the scheduled departure for a non-commuting inter-city trip. Travel times for future rail and passenger-only ferry were provided by BC Rail and West Coast Express. Note that access times are presented for illustrative purposes and were not used to estimate or forecast travel demand.

Fare levels for the future rail options were established on the assumption that train service should operate on a commercial (non-subsidized) basis. Fare levels for the passenger-only ferry/bus service are based on similar private-sector services operating in North America.

Capital and operating costs are summarized in Exhibit 2.3. Note that highway and rail capital costs are based on information from the Reid Crowther study. Highway and rail incremental operating and maintenance costs were provided by the Ministry of Transportation and BC Rail, respectively. Passenger-only ferry capital and operating costs were also provided by the Ministry of Transportation[2].


N
Partial Bypass
WHISTLER
Selected highway safety improvements
SQUAMISH
4-Lane Bypass
Existing rail service maintained
4 laning in rural segments
HORSESHOE BAY
NORTH VANCOUVER
VANCOUVER CENTRAL WATERFRONT
LEGEND
AUTO/BUS
RAIL
MARINE

Corridor Option 1 – Highway Emphasis

The main improvement feature of Option 1 is the four laning of Highway 99 North from Horseshoe Bay to Squamish. The portion of the highway north of Squamish will remain a two-lane facility. Safety improvements recommended by ICBC will be implemented throughout the corridor. As well, bypasses will be provided for Squamish and Whistler. Note that the safety improvements and bypasses within the urbanized section of the corridor are common to all four corridor options.

Five tunnels (at the vicinity of Horseshoe Bay, Porteau Cove and Furry Creek) will be constructed on the four-lane sections to enhance the highway alignment and improve capacity. A four-lane bypass will be provided at Squamish. For Whistler, a partial bypass with a possible connection to Lorimer Road would be provided. This option also includes minimum rail investment, which covers new or refurbished rolling stock and upgrades of level crossings at key locations.

Operational Characteristics

The travel time by passenger vehicle from Downtown Vancouver to Squamish would be approximately one hour based on average conditions. The travel time from Downtown Vancouver to Whistler would be one and three-quarter hours. The average cost of travel (including fuel and vehicle maintenance) is estimated at $8 one-way from Downtown Vancouver to Squamish, and $16 one-way from Downtown Vancouver to Whistler. For this option, inter-city bus and rail services are not assumed to change significantly from current operation.

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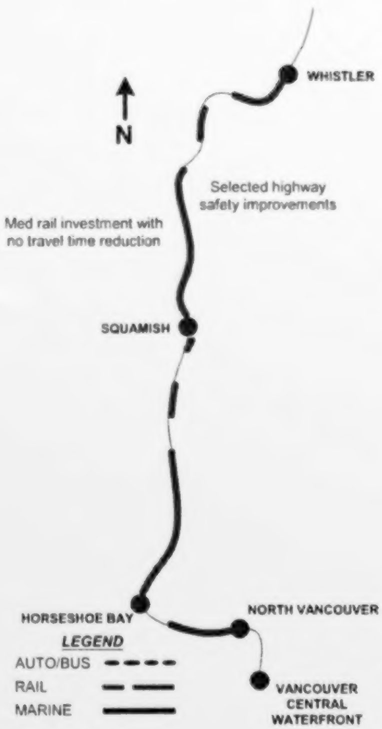
[2] Jonathan Seymour & Associates Inc, Marine Options Greater Vancouver to Squamish – Feasibility Study, BC Ministry of Transportation, December 2001.

Capital and Operating Costs

The capital cost for the four-laning from Horseshoe Bay to Squamish is estimated to be $750 million. The aggregated cost of safety improvements, bypass constructions and miscellaneous upgrades within Squamish and Whistler is estimated at $206 million. The latter cost is common to the three remaining corridor options. Incremental annual operating and maintenance costs for these highway improvements are estimated at $0.85 million[3]. Capital costs for refurbished passenger rail rolling stock and upgrades at level crossings are estimated at $40 million.

Corridor Option 2 - Medium Rail Investment


WHISTLER
N
Selected highway safety improvements
Med rail investment with no travel time reduction
SQUAMISH
HORSESHOE BAY
NORTH VANCOUVER
VANCOUVER CENTRAL WATERFRONT
LEGEND
AUTO/BUS
RAIL
MARINE

The scope of the medium rail investment includes those identified for the minimum improvements (e.g. refurbished rolling stock and upgrades at level crossings) and the following:

- ❑ Additional rolling stock to allow for up to five trains per day per direction with peak period capacity up to 2,250 passenger seats in the peak direction.
- ❑ Extension of passenger rail service to Lonsdale Quay.
- ❑ BC Rail remains a predominantly freight railway.
- ❑ Provision of Centralized Train Control (CTC) system to handle the increased service. CTC track allows for remote operation of switches and monitors switch position integrity to ensure safe train movements.
- ❑ Provision of track protection program, equipment maintenance and improved crew facilities.
- ❑ Station upgrade on platforms, bus loops and additional parking at Whistler and Lions Bay.

These improvements are aimed at improved service frequency and operational reliability. The line-haul travel time from North Vancouver to Whistler will remain 2 hours and 35 minutes.

This option also includes highway safety improvements and bypasses in urbanized sections of the corridor as described in Option 1.

Operational Characteristics

Passenger rail service would be increased from the one train per day to three trains per day per direction, and potentially up to five trains per day in the peak direction during peak demand periods. The adult fare from North Vancouver would be $25 one-way to Squamish and $50 one-way to Whistler.

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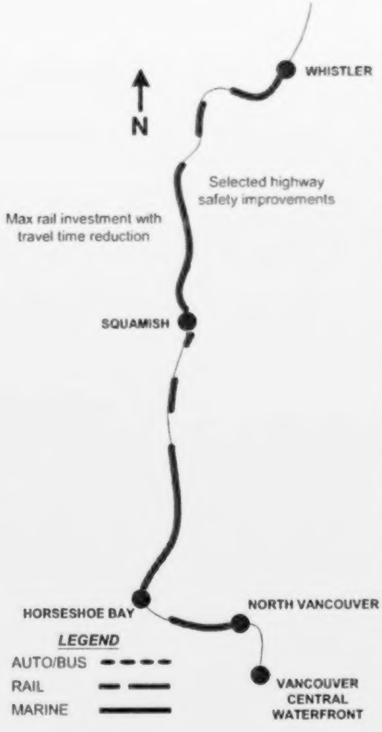
[3] MOT staff indicated annual highway O&M costs between Horseshoe Bay and Squamish are approximately $1.1 million, and $1.25 million between Squamish and Whistler (total $2.35 million). These costs are estimated to increase to by $0.85 million with the four-lane upgrade. Safety improvements alone are not expected to significantly impact current O&M costs.

The total travel time, including line-haul, wait and boarding time, is estimated to be two hours from North Vancouver to Squamish and three hours to Whistler. To reach the North Vancouver Station from the Central Waterfront would require approximately 20 minutes by SeaBus and 30 minutes by private automobile. This travel time accounts for the relocation of the rail station to the vicinity of Lonsdale Quay.

Capital and Operating Costs

The capital cost for the medium rail option, including the minimum rail investment, is estimated to be $318 million. Incremental annual operating costs are estimated at $23 million.

The cost of safety improvements, bypass constructions and miscellaneous upgrades within Squamish and Whistler is estimated at $206 million. Incremental highway operating and maintenance costs would not be significant.


WHISTLER
N
Selected highway safety improvements
Max rail investment with travel time reduction
SQUAMISH
HORSESHOE BAY
NORTH VANCOUVER
VANCOUVER CENTRAL WATERFRONT
LEGEND
AUTO/BUS
RAIL
MARINE

Corridor Option 3 - Maximum Rail Investment

The scope of the maximum investment will include those identified for the minimum and medium investment improvements. The key feature of the maximum investment is the reduction of line-haul travel time from North Vancouver to Whistler by up to 25 minutes. Four tunnels would be constructed at the West Vancouver, Brunswick, Britannia and Brandywine sections for alignment improvements.

Operational Characteristics

With the reduction of line-haul time resulting from the maximum investment, the total travel time for the rail service, including wait and boarding time, is estimated to be one and three quarter hours from Lonsdale Quay to Squamish and two and three quarter hours to Whistler. Access time from the Central Waterfront by SeaBus and passenger vehicle would remain the same as Option 2.

The adult fare from North Vancouver would be $35 one-way to Squamish and $70 one-way to Whistler. The service frequency would remain at three trains per day per direction, and potentially up to five trains per day in the peak direction during peak demand periods.

Capital and Operating Costs

The capital cost for the maximum rail option, including the minimum and medium rail investment, is estimated to be $568 million. Incremental annual operating costs are estimated at $23 million[4].

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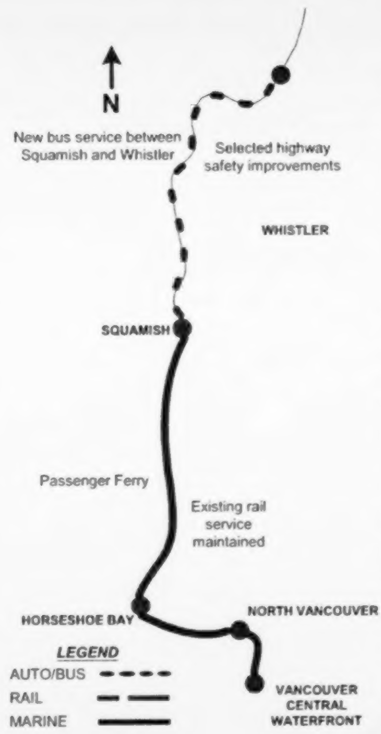
[4] Includes a compensatory track rate for use of BC Rail infrastructure.

The cost of highway safety improvements, bypass constructions and miscellaneous upgrades within Squamish and Whistler is estimated at $206M.


N
New bus service between Squamish and Whistler
Selected highway safety improvements
WHISTLER
SQUAMISH
Passenger Ferry
Existing rail service maintained
HORSESHOE BAY
NORTH VANCOUVER
VANCOUVER CENTRAL WATERFRONT
LEGEND
AUTO/BUS
RAIL
MARINE

Corridor Option 4 – Passenger-Only Ferry/Bus

A two-vessel passenger-only ferry service will be provided from a new berth on the Vancouver Central Waterfront to Darrell Bay south of Squamish. It is assumed that 220 passenger capacity vessels would be deployed for the service. Park-and-ride facilities, bus loop and feeder buses will be provided for connection to and from Whistler and Squamish.

Operational Characteristics

The ferry service would operate between the Central Waterfront (likely from a new berth located between SeaBus and Canada Place) and Darrell Bay south of Squamish. Connecting buses and facilities would be provided at the north terminus for travellers to Whistler or into Squamish.

The passenger-only ferry service would likely run four times per day per direction. Total travel time between Vancouver and Squamish, including wait and boarding time, is estimated to be one hour. Total travel time from Vancouver to Whistler, including ferry and connecting bus travel, and including wait, boarding and transfer time, is estimated to be two and three quarters hours.

The cost of the passenger-only ferry service one-way would be $25 to Squamish, and $35 one-way for the combined ferry-bus service to Whistler. As mentioned earlier, these fare levels are consistent with similar North American commercial services.

Capital and Operating Costs

The capital cost for the passenger-only ferry option is estimated at $25.3 million including $23.8 million for two new 220 passenger vessels and $1.5 million for a new berth between SeaBus and Canada Place and at Darrell Bay. Annual operating costs for the ferry are estimated at $6.7 million. Two highway coach buses would be required to transport passengers between Squamish and Whistler at an annual cost of $0.75 million.

Note that this option also includes the highway safety improvements and minimum rail upgrades which are estimated at $206 million and $40 million respectively.

Exhibit 2.1 – Travel Time and Cost - Downtown Vancouver to Squamish

	Current Modes			Future Concepts			
	Car	**Greyhound Bus**	**Cariboo Prospector**	**Option 1 Hwy Emphasis**	**Option 2 Med Rail**	**Option 3 Max Rail**	**Option 4 Pass Ferry/Bus**
A. Daily Frequency	Anytime	7 NB, 7 SB	1 NB, 1 SB	Anytime	3 NB, 3 SB	3 NB, 3 SB	4 NB, 4 SB
B. Travel Time (minutes)							
Access	10	15	30	10	20	20	10
Wait		20	30		30	30	20
Travel	70	80	85	55	85	70	45
Transfer							
Total	80	115	145	65	135	120	75
C. Out-of-pocket Cost ($)							
Access		$5	$10		$5	$5	$5
Travel	$8	$8	$20	$8	$25	$35	$25
Total	$8	$13	$30	$8	$30	$40	$30
D. Perceived Costs ($)							
Travel Time1	$13	$19	$24	$11	$23	$20	$13
Out-of-pocket2	$8	$13	$30	$8	$30	$40	$30
Total	$21	$32	$54	$19	$53	$60	$43

1 Value of time assumed to be $10/hour.

2 Perceived or out-of-pocket operating cost assumed to be 13 cents per km.

Exhibit 2.2 – Travel Time and Cost - Downtown Vancouver to Whistler

	Current Modes			Future Options			
	Car	Greyhound Bus	Cariboo Prospector	Option 1 Hwy Emphasis	Option 2 Med Rail	Option 3 Max Rail	Option 4 Pass Ferry/Bus
A. Daily Frequency	Anytime	7 NB, 7 SB	1 NB, 1 SB	Anytime	3 NB, 3 SB	3 NB, 3 SB	4 NB, 4 SB
B. Travel Time (minutes)							
Access	10	15	30	10	20	20	10
Wait		20	30		30	30	20
Travel	120	155	155	100	155	130	120
Transfer							20
Total	130	190	215	110	205	180	170
C. Out-of-pocket Cost ($)							
Access		$5	$10		$5	$5	$5
Travel	$16	$20	$39	$16	$50	$70	$35
Total	$16	$25	$49	$16	$55	$75	$40
D. Perceived Costs ($)							
Travel Time[1]	$22	$32	$36	$18	$34	$30	$28
Out-of-pocket[2]	$16	$25	$49	$16	$55	$75	$40
Total	$38	$57	$85	$34	$89	$105	$68

1 Value of time assumed to be $10/hour.

2 Perceived or out-of-pocket operating cost assumed to be 13 cents per km.

Exhibit 2.3 – Capital and Operating Cost Estimates Summary

	Option 1 - Hwy Emphasis	Option 2 - Med Rail	Option 3 - Max Rail	Option 4 - Pass Ferry/Bus
Capital ($M)				
Highway Safety Improvements	$ 206.0	$ 206.0	$ 206.0	$ 206.0
4 Laning to Squamish[1]	$ 750.0			
Minimum Rail	$ 40.0			$ 40.0
Medium Rail Investment		$ 318.0		
Maximum Rail Investment			$ 568.0	
Ferry berths and vessels				$ 25.3
Total Capital	$ 996.0	$ 524.0	$ 774.0	$ 271.3
Annual Operating/Maintenance ($M)				
Highway	$ 0.85			
Rail		$ 23.0	$ 23.0	
Ferry and Bus				$ 7.45
Total Annual O&M	$ 0.85	$ 23.0	$ 23.0	$ 7.45

1. MoT is currently revising these estimates.

3. Survey and Market Research Data

This section provides an overview of the existing corridor data and market research and surveys that were conducted to support the model development and option evaluation. This information provides a basis for establishing current demand levels in the corridor, and for assessing users perceptions of different service concepts. The information is then combined with forecasts of key drivers (e.g. population by age category) to establish future demand estimates by mode.

For the purpose of this study, two key market segments have been defined as follows:

- ☐ Study Area Residents (Lower Mainland and Corridor)
- ☐ Non-Residents (Rest of B.C., Rest of Canada, U.S. and other)

This is important to note as the definitions used by other agencies and in fact some of our own market research vary slightly. However, all of the information used in the model development and option forecasting has been reconciled to the above definitions.

3.1 Summary of Existing Data

Current and historic travel data for the Sea-to-Sky corridor is available from a variety of sources. This information includes traffic counts, vehicle and passenger origin/destination and trip purpose data, and annual visitor data to Whistler. Limited information is also available on potential corridor developments.

3.1.1 Traffic Count and Classification Data

Traffic count data is available from previous reports and the Ministry's permanent and short count stations along the Sea-to-Sky corridor. This information has been summarized for relevant stations in the following series of exhibits.

Exhibit 3.1 provides the historic growth in Average Annual Daily Traffic (AADT) at three permanent count stations. Note that the AADT just north of Horseshoe Bay and just south of Squamish are very similar in the year 1990, at approximately 9,500 vehicles per day. This indicates that most vehicle trips that entered the corridor just north of Horseshoe Bay continued to Squamish, and vice versa. By the year 2000 AADT just north of Horseshoe Bay has grown to approximately 13,500, or 4 percent per year. The AADT just south of Squamish had grown to just 11,000, or 1.8 percent per year. This suggests that much of the vehicle growth experienced on Highway 99 just north of Horseshoe Bay is related to activity in communities in the southern part of the corridor such as Lion's Bay and Furry Creek.

Traffic volume between Squamish and Whistler has grown from 4,300 per day in 1990 to almost 8,000 per day in year 2000. This represents a growth rate of 7 percent per year and is similar to the growth experienced north of Horseshoe Bay in absolute terms. As this rate of growth is not evident south of Squamish, much of this growth could be related to increased activity between Squamish and Whistler (e.g. commuting, recreation, etc.), and not necessarily long distance travel.

Exhibit 3.2 shows the monthly average traffic volumes in relation to the AADT. It is noteworthy that the profiles are similar for all three stations on the corridor, where vehicle traffic peaks in the late summer. The month of August represents the peak traffic month, while November is the lowest at most stations. In general, winter average daily traffic (WADT) volumes are approximately 75 percent of the summer average (SADT).

Exhibit 3.3 provides an average 2000 hourly profile by direction for each station. The profile for the stations just north of Horseshoe Bay and just south of Squamish are similar, and show a peak in activity during the PM peak period. The station between Squamish and Whistler shows more of a typical commuting profile, where maximum NB demand occurs during the AM peak period, and maximum SB demand occurs during the PM peak period.

Although daily traffic volumes are highest during the summer, the peak hourly traffic volumes occur in the winter. In the northbound direction, the peak hourly volumes occur on Friday evenings and Saturday mornings. In the southbound direction, the heaviest volumes are on Sunday afternoons. These times correspond with weekend skiers travelling to and from Whistler.

3.1.2 Origin/Destination, Mode and Trip Purpose Data

Existing origin/destination survey data for the corridor is fairly limited. Previous roadside interview surveys have gathered information on passenger car origin/destinations, trip purpose and occupancy. Additionally, the 1996 Census provided information on commuter trip patterns in the corridor. The following is a summary of relevant roadside surveys and their survey periods:

- ☐ July 1989 – Lions Bay (Thursday and Friday)
- ☐ March 1991 – 10 km N. of Squamish (Friday afternoon and Saturday morning – NB)
- ☐ June 1996 – Census Place of Work Place of Residence (20 percent household sample)
- ☐ February 1997 – south of Whistler Creekside (Saturday afternoon)
- ☐ July 1997 – south of Whistler Creekside (Saturday afternoon)
- ☐ August 2000 – 4 Lower Mainland border crossings (weekdays and weekends)
- ☐ November 2000 - 4 Lower Mainland border crossings (weekdays and weekends)

The 1996 Census and 1997 Whistler surveys provide origin-destination information for the commuting market and trips to and from Whistler. The 2000 surveys at the Canada/U.S. border crossings provide timely information for Washington and Oregon State residents. The information was used to develop preliminary demand matrices by trip purpose, and provides a basis for verifying the market research demand estimates.

In addition to passenger car data, limited multi-modal origin/destination information was available for rail, bus and Whistler tourists from the following sources:

- ☐ Winter 1998/99: Skier Mode Split by Place of Residence (Whistler Resort Association – ACTRAN Report)
- ☐ Spring 1992: BC Rail Cariboo Prospector Passenger Survey
- ☐ 1999: Bus and Rail Corridor Estimates (MANOP – Reid Crowther Appendix K).
- ☐ 2000: BC Rail Cariboo Prospector Origin/Destination Passenger Counts

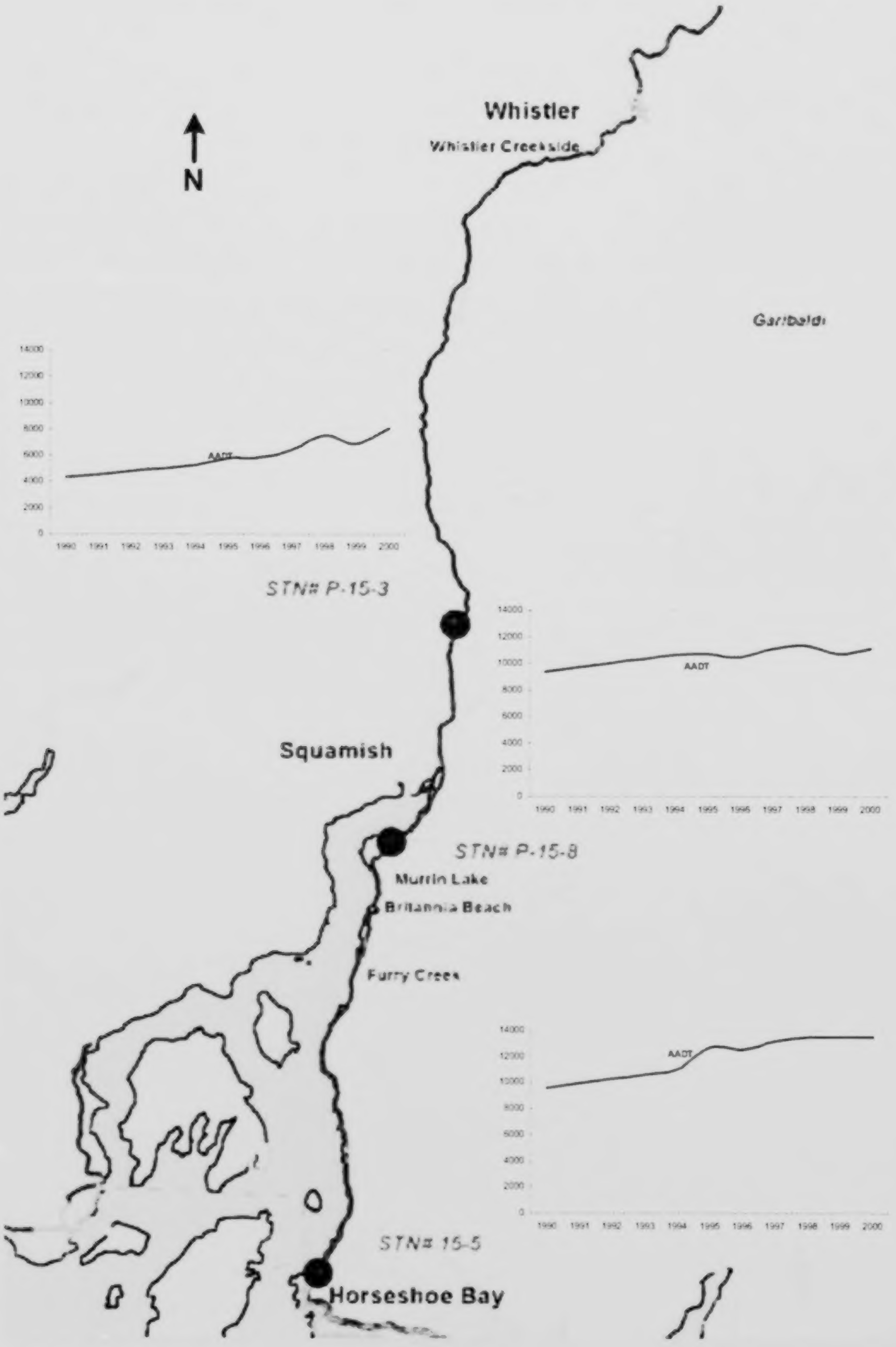
The above information was also analyzed and consolidated into a series of preliminary rail and bus demand matrices.

Tourism Whistler provides information on annual and seasonal visitors. For the 1999/2000 winter and summer season, Whistler reported approximately 2.16 million visitors (0.96 million winter 1.2 million summer). Statistics are available on room nights by place of residence, length of stay, average party size, mode choice, etc. Note that Whistler's definition of a visit includes trips made by Lower Mainland residents, but does not include trips by corridor residents (e.g. Squamish, Pemberton).

3.1.3 Potential Corridor Developments

Although the timing and likelihood of future corridor developments are uncertain, they could have a pronounced affect on travel demand. Two proposed developments that are currently being considered include Garibaldi at Squamish and Cayoosh Ski Resort. Garibaldi is located 13 kilometres north of Squamish and at full build out would have the capacity for 19,000 skiers and include 12,500 bed units (Whistler currently has 42,000 bed units with a cap of 53,000). The Cayoosh project, approximately one hour north of Whistler, situated between Pemberton and Lillooet would employ up to 6,000 people and could accommodate as many as 12,500 skiers.

It is important to note that the BC Stats demographic forecasts, used to estimate future travel demand, incorporate economic and demographic growth variables. Therefore, economic development impacts are reflected in the travel forecasts described in the following sections.


Whistler
Whistler Creekside
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Garibaldi
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12000
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8000
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4000
2000
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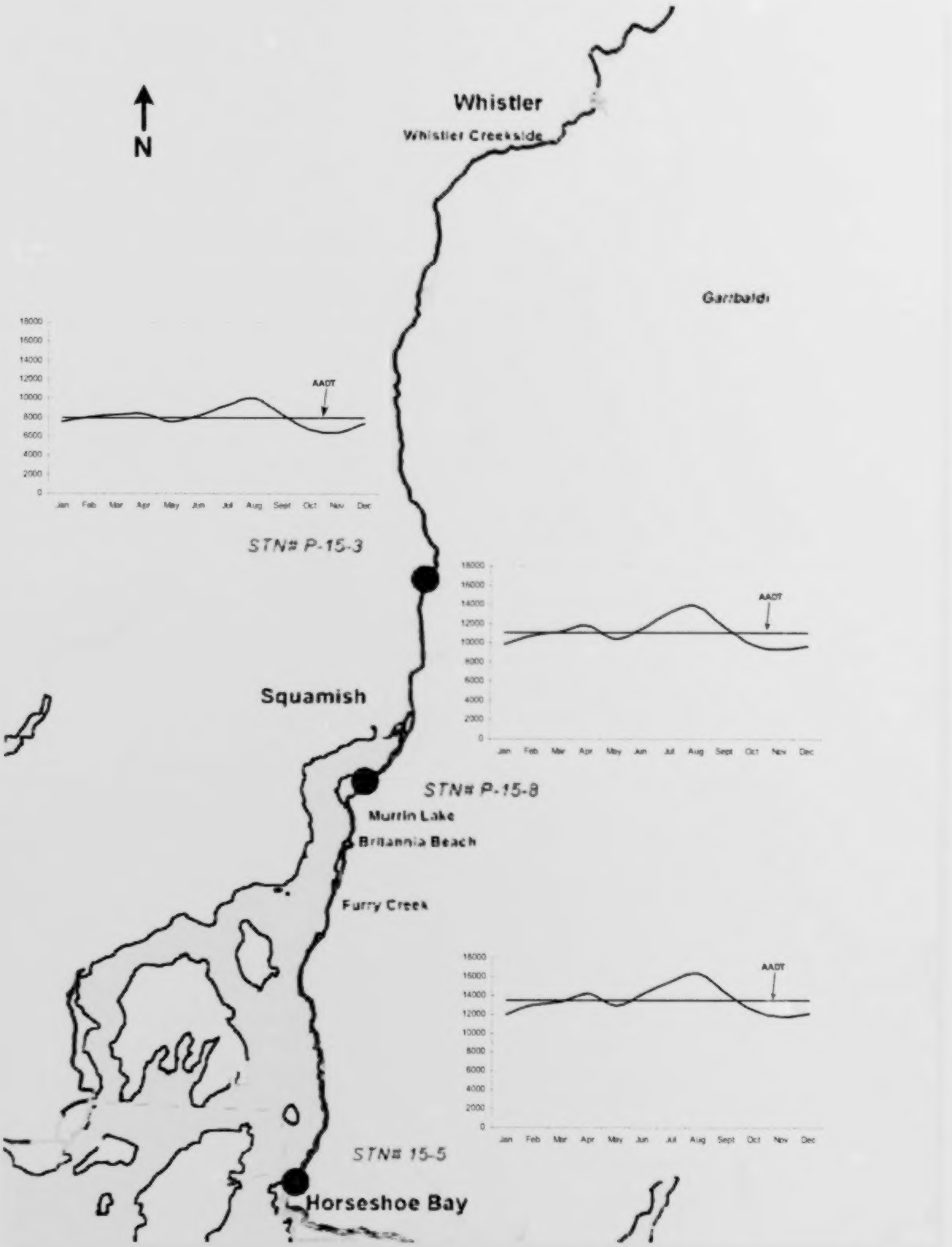
AADT
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
STN# P-15-3
Squamish
STN# P-15-8
Murrin Lake
Britannia Beach
Furry Creek
STN# 15-5
Horseshoe Bay

Exhibit 3.1 – Historical Average Annual Daily Traffic (1990 to 2000)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Whistler Creekside
Garibaldi
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12000
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6000
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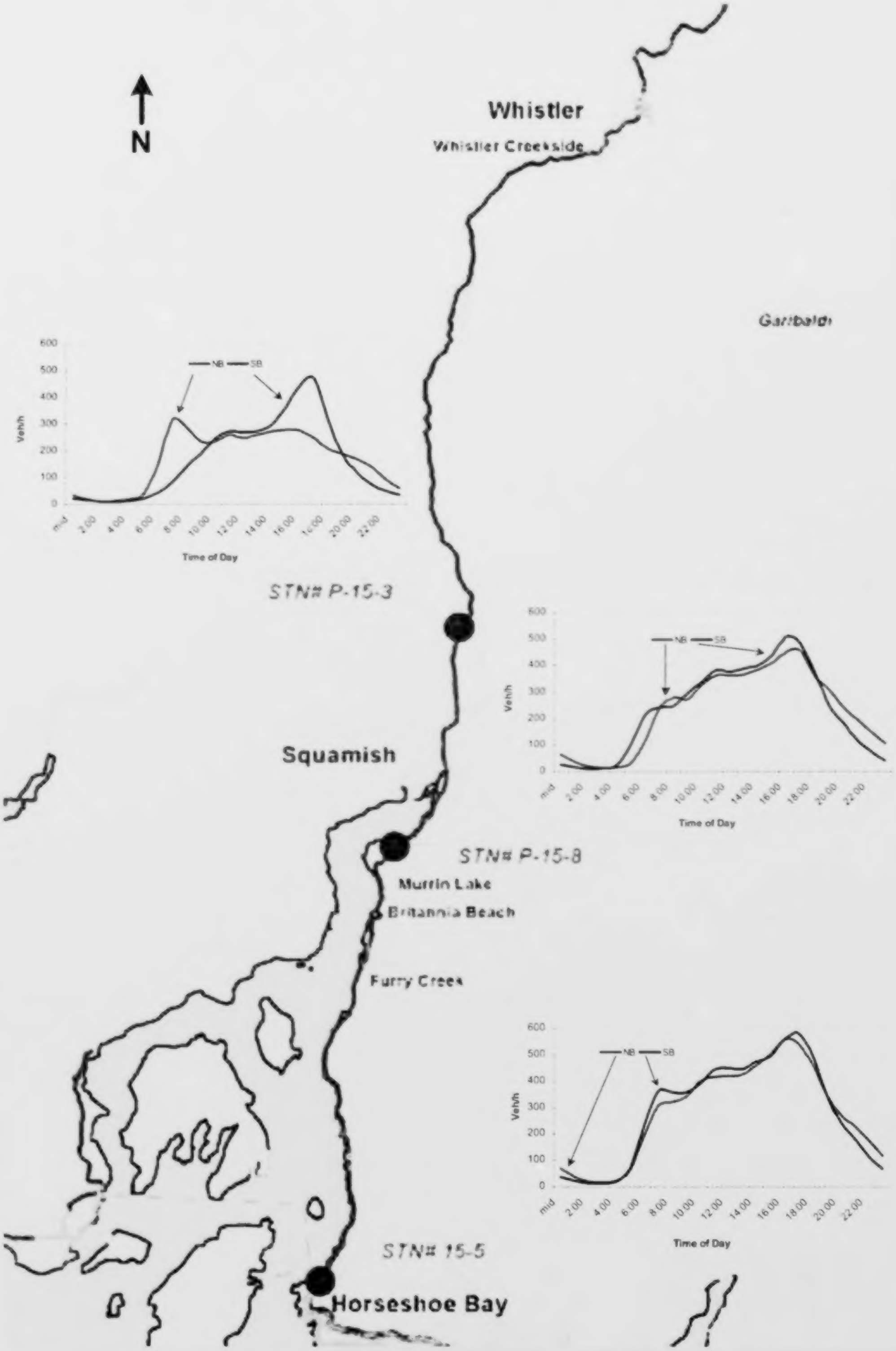
STN# P-15-3
Squamish
STN# P-15-8
Murrin Lake
Britannia Beach
Furry Creek
STN# 15-5
Horseshoe Bay

Exhibit 3.2 – Monthly Average Daily Traffic (2000)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Time of Day
STN# P-15-3
Squamish
STN# P-15-8
Murrin Lake
Britannia Beach
Furry Creek
STN# 15-5
Horseshoe Bay

Exhibit 3.3 – Average Hourly Profile (2000)

3.2 Demand Phase Market Research

Two marketing research studies were conducted to provide insight into the habits, the needs and preferences of Sea-to-Sky corridor users and to assess consumer interest in four corridor options - highway emphasis, medium rail investment, maximum rail investment and passenger-only ferry/bus. In addition, the survey data provides primary research data to assist in the demand model forecasting of corridor travel.

A random telephone survey of over 1,800 B.C./Cascadia residents was completed, yielding about 900 past year users of the Sea-to-Sky corridor. This information was used to construct origin/destination profiles by trip purpose for corridor and Lower Mainland residents. Additionally, the option testing results were used to establish latent demand and diversion to various modes[5].

Additionally, an intercept survey was conducted in Whistler in mid-October. Interviews were conducted with more than 200 non-residents to determine their current travel characteristics and their perception of the corridor options. It is important to note that this survey was conducted during the shoulder season. As a result, the information had to be combined with other information sources to develop an appropriate annual demand profile. An annual non-resident visitor control population was developed from a combination of data sources provided by Tourism Whistler.

Since so few Washington/Oregon users of the corridor were found in the telephone survey (just 3 percent of those residents 16 years of age and over), the telephone survey information presented is based on GVRD and corridor residents only. The on-site survey results include visitors from U.S. Cascadia.

The key findings from these studies are summarized briefly below. Appendix A contains a more comprehensive discussion of results from both surveys.

3.2.1 Key Market Research Findings

Corridor Travel in the Past Year among the Resident Market

- About 4-in-10 residents of the GVRD have travelled on the Sea-to-Sky Corridor in the past year. Virtually all who reside in the Sea-to-Sky Corridor are past year users of the route.
- The corridor is well-used in both seasons, but summer travellers exceed the proportion using the corridor in the winter (77 percent of residents travelled this past year in the summer versus 63 percent in winter).
- Whistler is the primary destination for the majority of GVRD residents travelling the corridor (78 percent in winter and 59 percent

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[5] Latent demand refers to travel that is induced due to expansion of person capacity on a corridor or facility. This is travel that would not otherwise be made and does not include trips that have changed start time, routing or mode as a result of the upgrade (see Appendix E).

in summer), while most Sea-to-Sky corridor residents are bound for the GVRD (63 percent in winter and 70 percent in summer).

- ❑ Despite the availability of current bus and train service, the private vehicle is the mode of choice for over 9-in-10 residents, GVRD and Sea-to-Sky corridor residents alike. Most are travelling in shared vehicles (about 90 percent of GVRD residents and about 65 percent of Sea-to-Sky residents). Winter and summer patterns are generally similar.
- ❑ Buses are reported as the mode used by about 7-9 percent of STS corridor residents, but only about half as many GVRD residents (3-4 percent).
- ❑ GVRD residents are generally travelling the corridor for recreational purposes, including vacationing. Sea-to-Sky corridor residents, however, use the corridor for a multitude of purposes with commuting/business trips (32 percent winter and 28 percent summer) as prevalent as shopping/personal trips (34 percent winter and 31 percent summer).
- ❑ Note that commuting travel on the corridor is quite high among Sea-to-Sky corridor residents (33 percent), but as might be expected negligible among GVRD residents (less than 1 percent). Based on this survey, about two-thirds of corridor commuters appear to be corridor residents, but more definitive information on origin-destination of corridor commuters is found in Section 4.

Corridor Travel Habits among Non-Residents

- ❑ Note that since the Whistler on-site survey was conducted in October, some aspects of the findings may be more reflective of the shoulder season.
- ❑ Nearly half of non-resident visitors encountered at Whistler were from the U.S. with 20 percent being Washington residents. Other Canada and Europe represented just under 20 percent each (17 percent and 19 percent, respectively), while Australia/New Zealand (7 percent) and Asia (just 5 percent) were less common, but may be greater at other times of year.
- ❑ Overall, a majority of non-residents are first-time visitors to the Whistler area (7-in-10), but among those from the West Coast, about half are repeat visitors.
- ❑ Their purpose is overwhelmingly recreation and vacation (87 percent) and so most are overnight visitors to Whistler (77 percent).
- ❑ About 6-in-10 travel to B.C. by air and most of the remaining balance by private vehicle.
- ❑ Travel to the Whistler area is predominantly by private or rented vehicle with slightly more in private vehicles (46 percent versus 33 percent rented). About 15 percent of this shoulder season's non-resident visitors have arrived by bus.

Reaction to Proposed Transportation Options

- ☐ The expanded highway is the most preferred of the transportation options presented. Note that the private vehicle is currently the mode choice of the vast majority, among both residents and non-residents.
- ☐ Among residents, the bus is the favoured alternative mode, lending support to the expanded highway option. Non-residents are known to be users of buses, particularly in the winter months (based on other sources).
- ☐ While the other proposed alternatives generate consumer interest from a minority—ranging from 15-27 percent among residents and 25-30 percent among non-residents, a strong commitment to use these options appears to be more limited. The "definitely would use" group for the rail and marine options tend to fall between 3-4 percent of residents and 5-8 percent of non-residents.

3.3 Bus Demand Profile Survey

Based on a preliminary review of available bus corridor data, it was determined that additional information on inter-city bus demand was required. Currently, the corridor is served by several charter companies and two scheduled services (Greyhound and Perimeter).

Information from the Motor Carrier Commission (MCC) was obtained to determine the bus companies that are licensed to serve the corridor. This information was used as a basis for developing a survey sample frame.

A total of 13 charter companies were contacted from the MCC records and asked to complete a demand profile survey. Nine of these companies responded, representing 25 percent of the corridor operators, but approximately 65 percent of the licensed fleet (as larger companies were over-sampled). Additionally, scheduled service operators were contacted as well as a small sample of "upon request" charter companies (companies that can serve the corridor under general intra-provincial licenses).

The information from this survey was used to develop an annual estimate of inter-city bus movements and ridership for the Sea-to-Sky corridor. The survey also provided information on seasonal variation, type of service, origin and destination locations and potential for future growth in the industry.

Some of the key findings from this study are highlighted below:

- ☐ Inter-city bus travel along the Sea-to-Sky corridor is comprised of approximately 40,000 annual vehicle movements and close to 700,000 bus passengers in 2000/2001.
- ☐ There are approximately 110 average daily bus movements in the corridor carrying approximately 1,900 passengers. Note that this varies dramatically by season. Average daily winter volumes and passengers are approximately double the summer season, which in turn are twice that of the off-season.

- The winter ski season (22 weeks) generates 65 percent more total ridership than the summer season (26 weeks), although anecdotal information indicates that the gap is narrowing.
- The business is shared by scheduled and charter services almost equally.
- Non-residents represent the single largest driver of this market.
- Charter services cater to non-residents but there is an important resident market, especially for summer day trips.
- Scheduled services cater to the local population but many non-residents use it also, as feeder services provide connections from the U.S., Vancouver Island and points east.
- The industry is cautiously optimistic about growth in the near-term and very optimistic in the longer term; indeed, through restrictive policies aimed to discourage private vehicles, they are interested in capturing a greater modal share in the corridor.

Appendix B contains a detailed report on the bus survey design and conduct and data analysis.

4. Travel Demand Model Development

The objective of this study is to evaluate a number of long-range supply options that will cater to inter-city travel demand along the Sea-to-Sky corridor. As such, the market research and model development have focused on inter-city travel demand (e.g. trips between Whistler and Squamish, and Whistler and the Lower Mainland, etc.).

Inter-city modelling differs from urban modelling in many respects. For inter-city modelling, it is often not necessary to generate local area travel as the focus is on inter-urban services. Another key difference is the time period to model. Urban models typically focus on a peak hour or period during the weekday. Inter-city models are often designed to forecast the amount of travel on an average day, including both weekday and weekend markets[6]. This is important for the Sea-to-Sky corridor, which has different seasonal and day-of-week characteristics.

For the purpose of this study, an AADT model was developed that reflects the different seasonal and day-of-week market segments. Information from this model can be factored to reflect a specific time period using existing profile information (see Section 3.1).

The following market segments are explicitly defined in the model:

A. Study Area Residents (Lower Mainland and Corridor)
   - ☐ Commuting/Business
   - ☐ Recreational/Social
   - ☐ Shopping/personal business

B. Non-Residents (Rest of B.C., Rest of Canada, U.S. and other)

While intra-city travel (e.g. a trip within a community) is important and represents a significant percentage of the overall demand in this region, it is outside the scope of this study. Note that travel by corridor residents has been estimated for trips made outside of the home community (e.g. travelling between Squamish and Whistler for commuting or recreational purposes). Also note that commercial vehicle movements (with the exception of buses) were not surveyed and are not explicitly addressed in the model.

In the future, it may be desirable to estimate the impact that certain options will have on intra-city travel (e.g. would the option reduce congestion on urban sections of Highway 99 North). Further, as the value of time for commercial vehicles is significantly higher than passenger vehicles, a survey of these activities would provide a basis for developing an inter-city truck model. The current travel demand model has been designed to accommodate this type of integration at a later stage.

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[6] Guidebook on Statewide Travel Forecasting, Federal Highway Administration, prepared by Centre for Urban Transportation Studies, University of Wisconsin, March 1999.

The following sections provide a description of the model development activities.

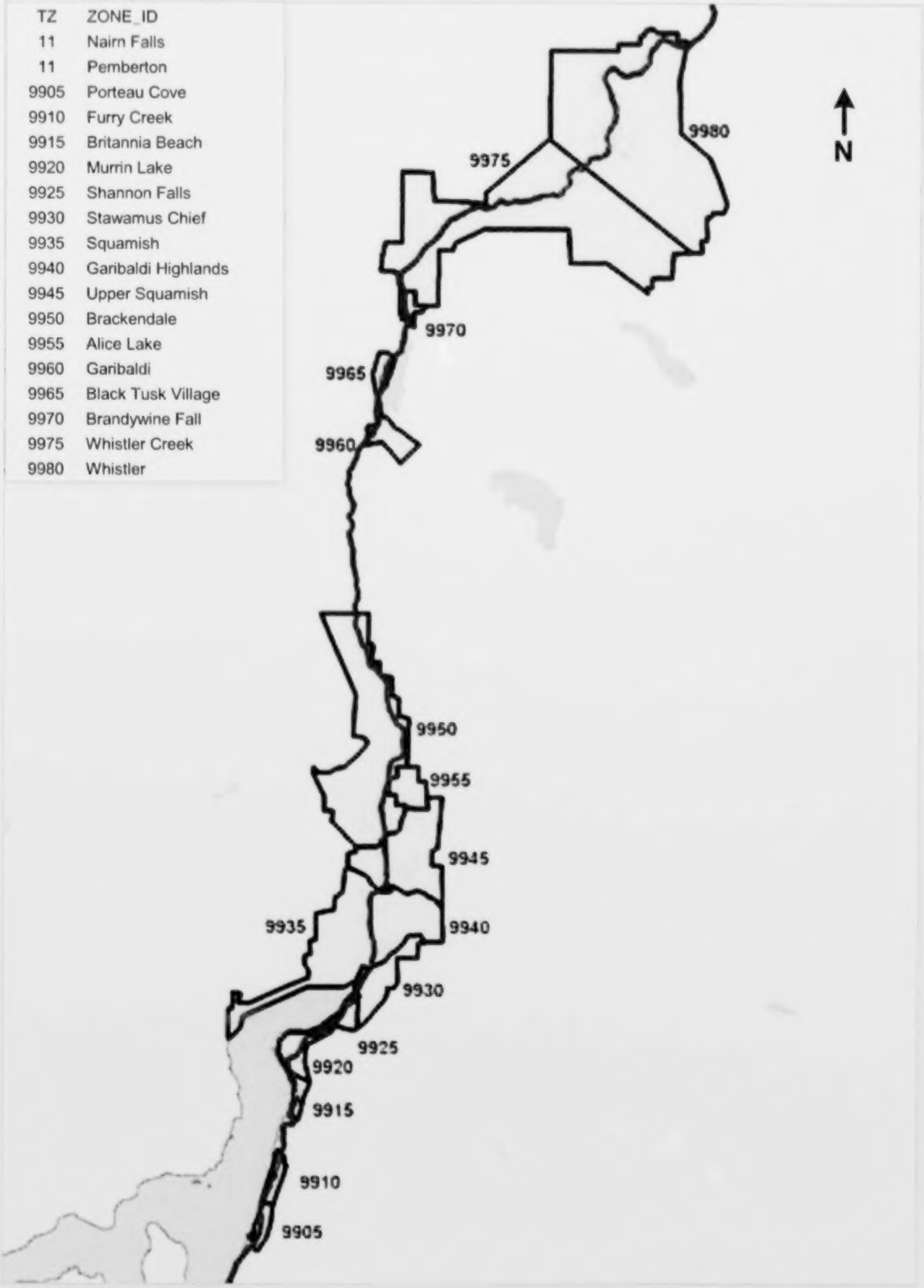
4.1 Traffic Zone System and Demographics

The current TransLink Regional Travel Model provides traffic zone and network coverage between Hope and Lions Bay. For this study, the zone system and network was extended north of Lions Bay to Whistler. Exhibit 4.1 shows the traffic zone system developed for the corridor and the corresponding place names. A total of 16 traffic zones were developed for the corridor based on municipal boundaries and major activity centres along the corridor (e.g. provincial parks).

For each traffic zone, detailed population by age category estimates were developed for the planning horizons of 2001, 2010 and 2025. These estimates were based on BC Stats latest forecast series for Local Health Areas and distributed to the zone system based on constant growth share assumptions. It is important to point out that the BC Stats forecasts incorporate economic and demographic growth variables, and therefore, economic development impacts are reflected in the travel forecasts. Appendix C describes the methodology used to develop population estimates for the Sea-to-Sky corridor and B.C. Lower Mainland.

For the purpose of forecasting non-resident travel, demographic estimates were developed for the Rest of B.C., Rest of Canada, the United States, Mexico, Western Europe and Japan. Appendix D describes the forecasting methodology for external or non-resident populations. Additionally, this appendix includes a discussion of the factors that influence non-resident travel demand.

Exhibit 4.2 provides a summary of total population by major area. The corridor population is forecast to grow at twice the rate of the Lower Mainland, which will impact the composition of travel demand in future years. It is interesting to note that several dominant international markets are showing slow or declining growth. It is noteworthy that in the under 45 age category, Europe and Japan are declining by 20-30 percent over the next 25 years (see Appendix D). This is especially significant for the Whistler winter market.



TZ	ZONE_ID
11	Nairn Falls
11	Pemberton
9905	Porteau Cove
9910	Furry Creek
9915	Britannia Beach
9920	Murrin Lake
9925	Shannon Falls
9930	Stawamus Chief
9935	Squamish
9940	Garibaldi Highlands
9945	Upper Squamish
9950	Brackendale
9955	Alice Lake
9960	Garibaldi
9965	Black Tusk Village
9970	Brandywine Fall
9975	Whistler Creek
9980	Whistler

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Exhibit 4.1 – Traffic Zones

Exhibit 4.2 – Total Population Estimates

Location	2001	2010	2025	% chg 01-10	% chg 01-25
STS Corridor	25,870	33,310	48,170	29%	86%
Lower Mainland	2,485,360	2,860,950	3,551,480	15%	43%
Rest of BC	1,876,810	2,105,670	2,495,660	12%	33%
Rest of Canada	30,644,600	32,941,600	35,716,700	7%	17%
United States	281,421,910	305,158,110	343,689,740	8%	22%
Mexico	100,349,770	114,994,750	133,834,710	15%	33%
Western Europe	390,660,880	397,522,580	396,445,360	2%	1%
Japan	126,549,980	127,252,380	120,235,270	1%	-5%

Note: STS Corridor includes Whistler, Squamish and all communities in between.

The use of other demographic and land use drivers was explored; however, future spatial information on employment, hotel units, and recreational capacity was limited. Additionally, the Whistler bed capacity constraint could result in changes in trip characteristics (e.g. shorter length of stay, more day trips) and encourage development in nearby communities. The net result of these changes may be a similar level of trip-making relative to base population levels and non-resident arrivals.

4.2 Road and Transit Network

The corridor road network was developed using GIS map coverage provided by the Ministry of Transportation and detailed corridor travel time information[7]. For the Lower Mainland, the TransLink network was used and modified to represent average daily travel times.

Bus, rail and ferry itineraries and networks were developed for existing services (e.g. Greyhound, Perimeter, Charter Bus, Cariboo Prospector) and future options. Travel times and boarding/alighting points were coded to reflect existing and proposed conditions.

4.3 Base Model Development

The base model development involved the following major activities:

- ❑ Establishing the current demand profile
- ❑ Development of demand forecasting methods

4.3.1 Current Corridor Demand Profile

For each market segment, seasonal trip matrices (winter and summer) were developed by mode (auto person, auto driver, bus and rail). These tables were based on information provided by the telephone, onsite and bus profile surveys. Additionally, Whistler visitor statistics, count station volumes, classification data and previous origin-destination information were used to verify and refine the tables.

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[7] Reid Crowther, Volume 2: Multi-Modal Corridor Transportation Study, BC Ministry of Transportation and Highways, 2000.

Due to the limited sample size of the market research, it was critical to establish control totals for key market segments from secondary data sources. Secondary controls were established for the following demand components:

- Non-resident demand to/from Whistler
- Bus demand for non-residents and residents
- BC Rail demand (Cariboo Prospector)
- Commuter/business demand

Non-resident Demand Control

A non-resident annual control total for trips to Whistler was established in order to factor the onsite survey results. Tourism Whistler reported 0.96 million visits for winter 1999/2000 and 1.15 million for summer 2000 for an annual total of 2.1 million. It is important to recognize that the definition of a visit does not include corridor residents travelling to Whistler. This number also likely under-represents trips made by people staying in private and time-share accommodations.

Using information on resort accommodation nights, length of stay and party size by place of origin, it was determined that non-residents made approximately 0.5 million winter trips and 0.4 million summer trips to Whistler in 2000. It is important to note that a visit produces two trips along the corridor, hence annual non-resident corridor trips to and from Whistler are approximately 1.8 million. As the onsite survey represented a shoulder period, additional information on winter mode choice by area of residence was used to construct average annual profiles.

Resident and Non-resident Bus Demand Control

As indicated in Section 3.4, there are close to 700,000 annual inter-city bus trips on the Sea-to-Sky corridor. This estimate was developed from the bus demand survey and verified against the information collected by the market research surveys and Tourism Whistler data (e.g. non-resident seasonal mode choice data). Exhibit 4.3 provides a breakdown of the reconciled annual bus demand by season, market and service type.

Exhibit 4.3 – Annual Bus Demand Estimates

	Winter	Summer	Annual
Non-Resident Total	**365,000**	**115,000**	**480,000**
Scheduled Service	171,090	53,910	225,000
Charter/Upon Request	193,910	61,090	255,000
Resident Total	**107,500**	**107,500**	**215,000**
Scheduled Service	37,500	37,500	75,000
Charter/Upon Request	70,000	70,000	140,000
Total	**472,500**	**222,500**	**695,000**

Rail Demand Control

Rail demand control totals for the Cariboo Prospector were provided by BC Rail (2000 passenger origin/destination based on ticket sales). This information showed approximately 35,000 one-way trips made annually within the corridor. The majority of travel was between the North Shore and Whistler. Previous market research conducted by BC Rail indicated that the majority of travel was for recreational/social activities and approximately 30 percent of the demand was by residents (corridor and Lower Mainland).

Commuter/Business Demand Control

Another important market segment is commuting and business travel along the corridor. The telephone survey asked about regular commuting patterns and information on the last trip in each season. This provided the ability to construct two commuting demand profiles, which were verified against the 1996 Census place of work data. Based on this exercise, it was determined that there are approximately 2.5 million inter-city commuting/business trips per year (one-way). Note that this number includes business travel, which could represent as much as 35 percent of this demand.

Base Year Demand Characterization

Based on the above information and the telephone survey expansion factors, a set of resident and non-resident trip tables were developed. As a final step, these origin/destination tables were converted to AADT vehicle trips, assigned to the digital road network and validated against mid-corridor count station volumes. Exhibit 4.4 provides an overview of the steps that were required to establish the base year demand matrices.

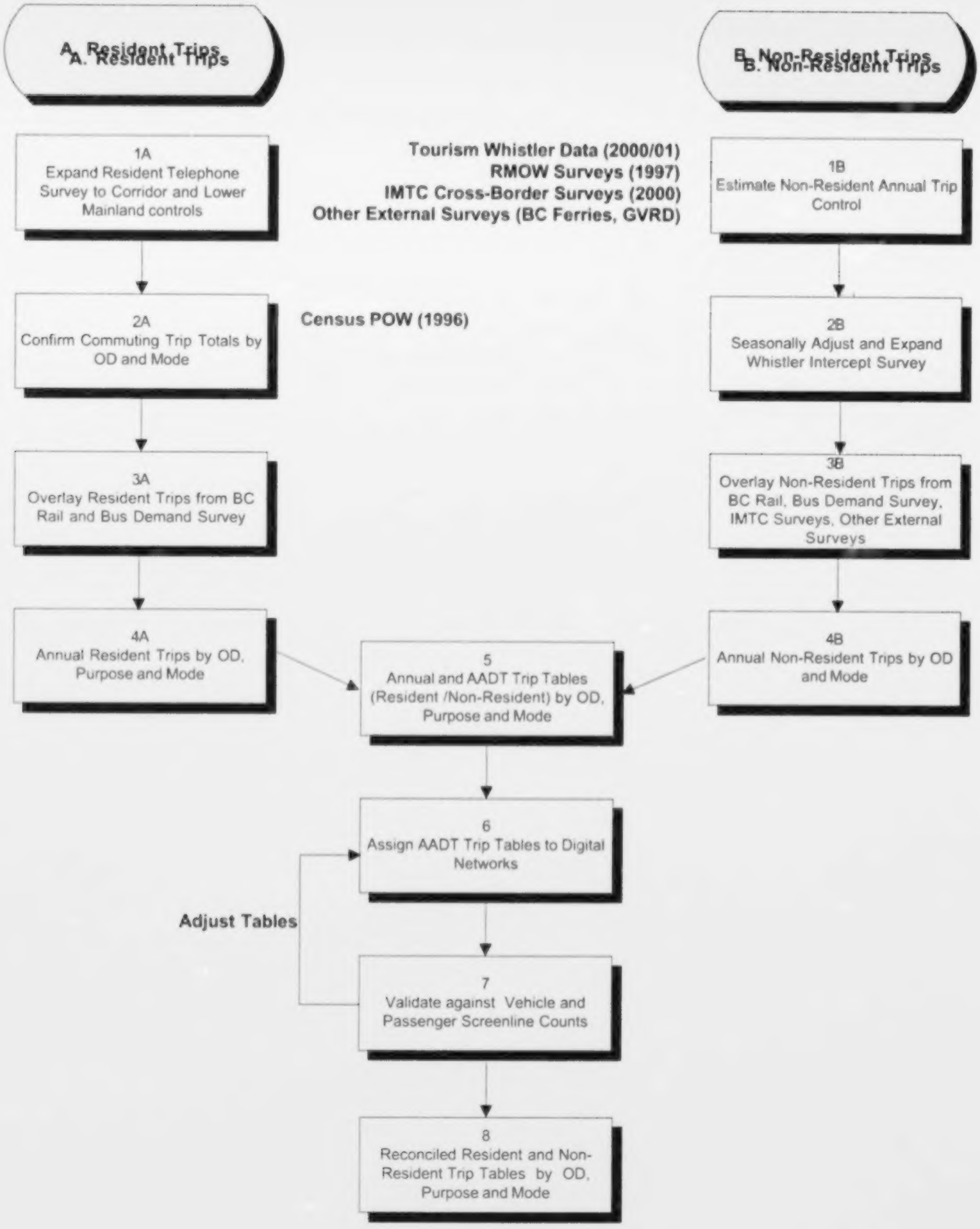

A. Resident Trips
B. Non-Resident Trips
1A
Expand Resident Telephone Survey to Corridor and Lower Mainland controls
Tourism Whistler Data (2000/01)
RMOW Surveys (1997)
IMTC Cross-Border Surveys (2000)
Other External Surveys (BC Ferries, GVRD)
1B
Estimate Non-Resident Annual Trip Control
2A
Confirm Commuting Trip Totals by OD and Mode
Census POW (1996)
2B
Seasonally Adjust and Expand Whistler Intercept Survey
3A
Overlay Resident Trips from BC Rail and Bus Demand Survey
3B
Overlay Non-Resident Trips from BC Rail, Bus Demand Survey, IMTC Surveys, Other External Surveys
4A
Annual Resident Trips by OD, Purpose and Mode
5
Annual and AADT Trip Tables (Resident /Non-Resident) by OD, Purpose and Mode
4B
Annual Non-Resident Trips by OD and Mode
6
Assign AADT Trip Tables to Digital Networks
Adjust Tables
7
Validate against Vehicle and Passenger Screenline Counts
8
Reconciled Resident and Non-Resident Trip Tables by OD, Purpose and Mode

Exhibit 4.4 – Data Reconciliation Steps

Exhibit 4.5 provides a summary of the annual one-way corridor trip totals by market segment.

Exhibit 4.5 – 2001 STS Trip Summary (one-way trips)

	Non-Residents	Residents	Total
Trip Mode			
Total Trips	**1,843,980**	**9,211,870**	**11,055,850**
Auto Person	1,339,915	8,987,395	10,327,310
Auto Driver	546,770	4,008,065	4,554,835
Bus Passenger	479,245	214,620	693,865
Train Passenger	24,820	9,855	34,675
Transit Mode Split	27%	2%	7%
Trip Purpose			
Commuting/Business		2,524,705	2,524,705
Recreation/Social		5,976,875	5,976,875
Shop/Personal Business		710,290	710,290
Non-Resident	1,843,980		1,843,980

Based on the above estimate, non-residents account for approximately 17 percent of the inter-city corridor demand. The remaining trips (83 percent) are made by residents of the corridor and Lower Mainland and are allocated as follows: commuting/business (23 percent), recreational social (54 percent) and shopping/personal business (six percent).

An example of the travel origins and destinations is shown in Exhibit 4.6 for the first leg of the trip (e.g. from residence or trip origin to destination, excluding the return trip). This exhibit shows total, resident and non-resident trips by major sub-areas.

A review of these tables provides the following insights on corridor travel demand:

- ☐ Corridor residents account for approximately 35 percent of inter-city travel, but represent only one percent of the corridor and Lower Mainland population.
- ☐ Whistler is the largest attractor accounting for approximately 55 percent of the trip destinations. Squamish attracts 15 percent of the demand, while Lower Mainland municipalities attract more than 20 percent of the total demand (primarily trips by corridor residents).
- ☐ Non-resident trips from other external to the Lower Mainland represent trips travelling south along the corridor from points north of Whistler.
- ☐ Although Whistler intercept surveys show approximately 65 percent of non-resident travellers arrive in the Lower Mainland by plane, the majority of visitors spend time in the Lower Mainland before travelling to Whistler. This explains the lower percentage of travel originating directly from Vancouver International Airport (YVR).

- ☐ Washington and Oregon residents driving across the border represent approximately 20 percent of the non-resident demand.
- ☐ Other external points include the ferry and rail terminals in the Lower Mainland, Highway 99 (north of Whistler) and Highway 1 and 7 in the east. These locations account for approximately 15 percent of the non-resident demand.

Exhibit 4.6 – Corridor Trip Tables by Trip Origin (excluding return trip)

2001 Total Trips from place of residence to destination (first leg excluding return trip)

	Whistler	Squamish	Other Corridor	North Shore	Vanc/Burn NW	Other L.M.	YVR	U.S. Border	Other External	Total
Whistler	-	58,950	7,050	45,660	119,160	46,830	-	-	4,700	282,350
Squamish	332,960	-	71,000	240,480	442,780	73,430	-	-	26,200	1,186,850
Other Corridor	29,850	83,280	-	120,800	87,560	8,700	-	-	2,740	332,930
North Shore	434,950	152,100	31,060	-	-	-	-	-	36,930	655,040
Vanc/BurnNW	1,376,800	275,350	76,650	-	-	-	-	-	97,920	1,826,720
Other L.M.	541,560	133,630	8,220	-	-	-	-	-	87,040	770,450
YVR	146,400	-	-	-	-	-	-	-	-	146,400
U.S. Border	189,940	-	-	-	-	-	-	-	-	189,940
Other External	86,470	29,990	-	4,110	16,030	650	-	-	-	137,250
Total	3,138,930	733,300	193,980	411,050	665,530	129,610	-	-	255,530	5,527,930

2001 Resident Trips from place of residence to destination (first leg excluding return trip)

	Whistler	Squamish	Other Corridor	North Shore	Vanc/Burn NW	Other L.M.	YVR	U.S. Border	Other External	Total
Whistler	-	58,950	7,050	45,660	119,160	46,830	-	-	4,700	282,350
Squamish	326,710	-	71,000	240,480	442,780	73,430	-	-	26,200	1,180,600
Other Corridor	29,850	83,280	-	120,800	87,560	8,700	-	-	2,740	332,930
North Shore	389,720	152,100	31,060	-	-	-	-	-	36,930	609,810
Vanc/BurnNW	1,053,600	275,350	71,650	-	-	-	-	-	97,920	1,498,520
Other L.M.	469,830	133,630	8,220	-	-	-	-	-	87,040	698,720
YVR	-	-	-	-	-	-	-	-	-	-
U.S. Border	-	-	-	-	-	-	-	-	-	-
Other External	210	-	-	1,110	1,040	650	-	-	-	3,010
Total	2,269,920	703,310	188,980	408,050	650,540	129,610	-	-	255,530	4,605,940

2001 Non-Resident Trips from place of trip origin to destination (first leg excluding return trip)

	Whistler	Squamish	Other Corridor	North Shore	Vanc/Burn NW	Other L.M.	YVR	U.S. Border	Other External	Total
Whistler	-	-	-	-	-	-	-	-	-	-
Squamish	6,250	-	-	-	-	-	-	-	-	6,250
Other Corridor	-	-	-	-	-	-	-	-	-	-
North Shore	45,230	-	-	-	-	-	-	-	-	45,230
Vanc/BurnNW	323,200	-	5,000	-	-	-	-	-	-	328,200
Other L.M.	71,730	-	-	-	-	-	-	-	-	71,730
YVR	146,400	-	-	-	-	-	-	-	-	146,400
U.S. Border	189,940	-	-	-	-	-	-	-	-	189,940
Other External	86,260	29,990	-	3,000	14,990	-	-	-	-	134,240
Total	869,010	29,990	5,000	3,000	14,990	-	-	-	-	921,990

4.3.2 Travel Demand Forecasting Procedures

The travel demand forecasting procedure developed for this study is based on a standard four stage process (e.g. generation, distribution, mode split and assignment).

Generating Resident and Non-Resident Trips

As mentioned earlier, population by age category was used as a driver for future resident travel demand. Trip rates were developed for each purpose by age category and major sub-area. Separation by age category is important as corridor trip rates decline with age and forecasts indicate an aging resident population. The major sub-areas included: Whistler, Squamish, Rest of Corridor, North Shore, Vancouver/Burnaby/New West, North Fraser and South Fraser. The trip rates were then applied to future demographic forecasts to produce annual trip totals by each sub-area. Exhibit 4.7 provides a summary of the average trip rates for the three main resident trip purposes. Note that these trip rates are for the first leg of the trip and for all persons 16 years or older. These rates are shown only for illustrative purposes as detailed rates by age category are used in the model.

Exhibit 4.7 – Average Annual Resident Trip Rates by Purpose and Sub-Area

	Annual Trip Rates from Place of Residence			
	Commuting/ Business	Recreation/ Social	Shop/Personal Business	Total
Whistler	7.8	11.3	7.4	26.5
Squamish	46.9	15.1	11.2	73.2
Rest Corridor	78.3	44.9	14.4	137.5
N. Shore	0.3	2.8	0.1	3.2
Van/Bby/NW	0.1	1.6	< 0.1	1.7
N. Fraser	0.1	0.9	< 0.1	1.0
S. Fraser	0.1	0.7	0.1	0.8
Total	0.5	1.5	0.2	2.1

Note: first leg trip rates (excluding return trip) for individuals age 16 and over.

As would be expected, corridor residents living outside of Squamish or Whistler have the highest average trip rates as they must travel the corridor for many of their activities. Squamish residents have the second highest trip rates, primarily due to the high levels of commuting along the corridor. For Lower Mainland residents, people from the North Shore have the highest corridor usage.

Trip generation for non-residents is driven by the growth in demographics and the change in propensity to travel to British Columbia and Whistler. Propensity is represented by the desire to choose Whistler over other world destinations. At this point, Whistler is a recognized "brand" by mature international travel markets. Therefore, any increased propensity to travel to Whistler will largely be a result of agglomeration effects within southern British Columbia. For example, as the Lower Mainland, Victoria and Whistler continue to grow, there will be more opportunities and attractions for visitors. This in turn will attract higher rates of non-resident travel. It is important to point out that due to the declining population in Japan and Europe (especially in the younger age categories), that their propensity factor will have to increase by 20 to 30 percent just to maintain current demand levels (see Appendix D).

Another factor to consider is the emergence of new travel markets (e.g. Mexico, Central and South America). As these areas continue to develop and prosper, citizens will be able to afford to travel more frequently. British Columbia and Whistler represent an attractive and unique destination for people who live in warm climates. These areas continue to show strong population growth rates and over the longer term are likely to increase their market share.

Finally the impact of the September 11th terrorist attacks cannot be overlooked. While the long-term impacts are uncertain, it is clear that in the short-term, recreational air travel will decline. Discussions with Tourism Whistler and YVR officials support this claim. However, they anticipate strong recovery in the next couple of years. The long-term impact that these events have on U.S. travellers is not known, but it is likely that they will continue to travel, but be more inclined to choose destinations within North America.

In summary, all of these factors will influence the magnitude and composition of non-resident demand. Based on a review of available information and discussions with Tourism Whistler, local demographers and airport officials, it was decided to use YVR passenger forecasts for air arrivals and population growth in B.C. and western U.S. and non-air arrivals.

For travellers arriving at YVR, non-resident trip growth is based on groundside air passenger forecasts. Air passenger forecasts are developed by Transport Canada using a sophisticated modelling technique. This model separates domestic and international markets and includes detailed fare information, demographic and economic growth estimates by world region. Earlier forecasts for YVR showed groundside air passengers doubling over the next 20 to 25 years. Given the September 11th events, forecasts for international air travel are expected to decline or stabilize in the short term. This is consistent with Tourism Whistler, which anticipates declines in hotel night sales this year, but anticipate low single digit growth rates within a few seasons. Therefore, YVR forecasts were modified to reflect a stabilization over the next several years, and then returning to previous forecast levels.

For non-air arrivals, trip forecasts are based on population growth rates for the Rest of British Columbia and the Pacific Northwest. Note that an increase in the propensity to travel to Whistler has not been included in this set of forecasts. Exhibit 4.8 provides a summary of the non-resident growth rates established for airport and non-air trips.

Exhibit 4.8 – Non-Resident Growth Factors

	Non-Resident Trip Growth Rates		
	2001 to 2010	2001 to 2025	Avg Annual Growth 01-25
YVR Arrivals	1.27	1.88	2.6%
Rest of BC (Hwy 1, 7, 99)	1.12	1.33	1.2%
US Border Crossings	1.15	1.42	1.5%

Trip Distribution and Mode Split

In order to produce future trip tables, trip rate factors were applied to the current year demand matrices by each trip purpose. This technique is commonly referred to as a proportionate method and was verified by comparing the forecasts of Whistler visits produced by secondary sources. Note that for the expanded highway option, latent demand factors were developed by sub-area based on information from the telephone survey (concept testing section).

Mode split for base forecasts are developed using existing origin/destination ratios. However, for each corridor option, mode diversion factors were developed based on the concept testing results. The mode diversion factors indicate the percentage of trips that will likely shift from their current mode to take advantage of the proposed option. These diversion rates were verified by estimating the demand for each option using a secondary approach. Additional details of the base and option forecasts are described in Section 5.

Travel Assignment Methods

For the network assignment stage, matrices are combined by mode and assigned to the 24 hour network using a shortest time path method. This assignment technique is appropriate in corridors where alternate routes are not available. For the auto network, average 24 hour travel times were developed within the Lower Mainland by modifying AM peak hour travel times derived from the TransLink model. For the Sea-to-Sky corridor, average travel times were coded for individual segments based on results from earlier Highway Capacity Manual (HCM) analysis.

For the transit network, matrices are assigned separately to their respective networks by sub-mode (e.g. bus, rail and ferry).

5. Option Forecasts and Evaluation

This section provides an overview of the base and option forecasts and the option evaluation. Section 2 provides a summary of the four concepts and the service attributes given to respondents during the market surveys. It is important to note that the following option forecasts are based largely on the stated preference of respondents based on specified supply scenarios. Therefore, changes in the travel time, convenience and cost assumptions cannot be readily assessed without further market research. Note that these forecasts were verified with secondary sources wherever possible.

5.1 Base Demand Forecasts for 2010 and 2025

For each horizon year, baseline forecasts were developed that represent a do-minimum alternative. These forecasts provide a basis for assessing the option forecasts. Using the travel forecasting procedures described in Section 4.3.2, AADT and annual travel forecasts were prepared for each market segment and mode. It is important to note that all forecasts prepared for this study assume the status quo with respect to Transportation Demand Management (TDM) measures (e.g. parking policies in Whistler do not change from today).

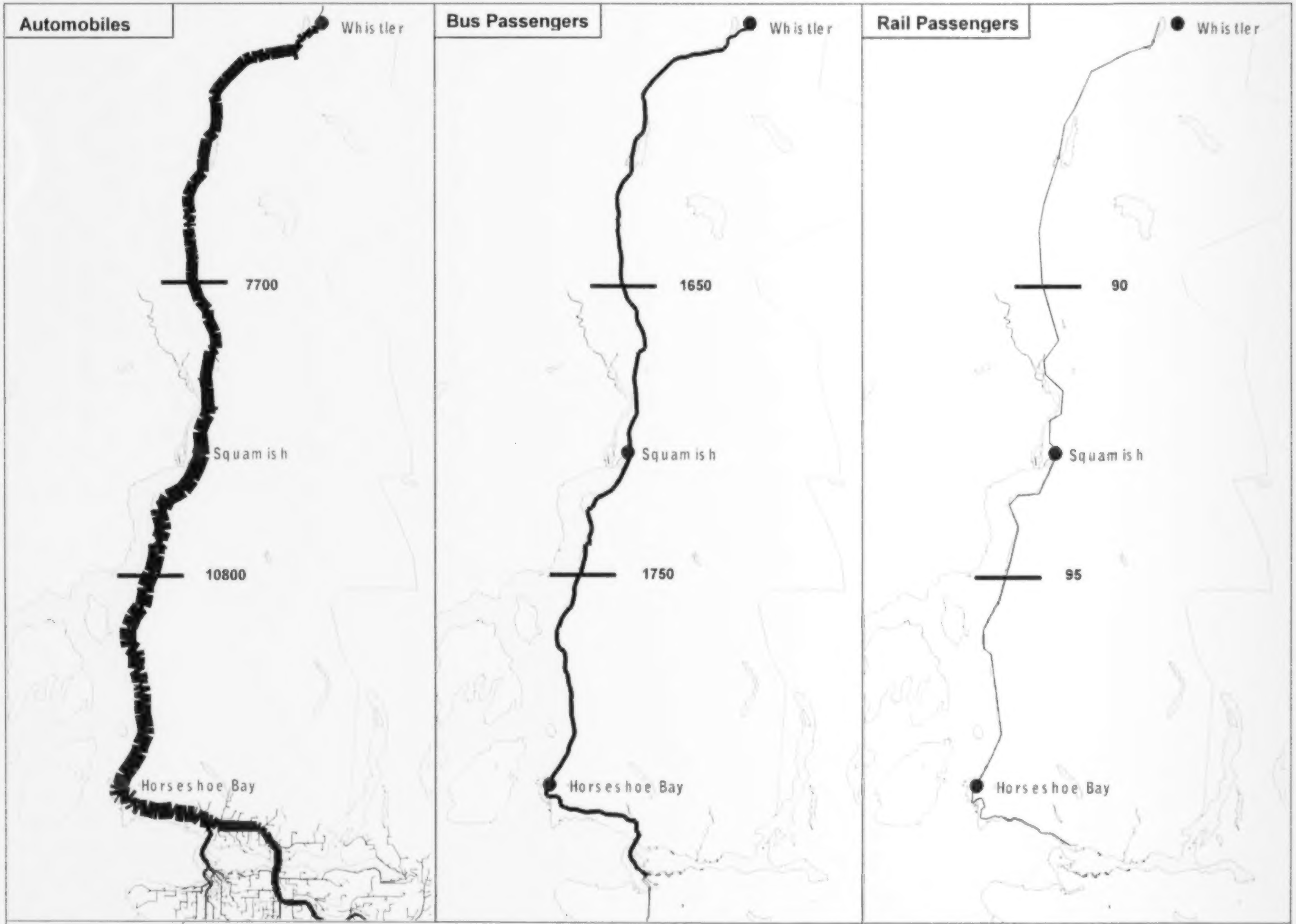
Exhibit 5.1 provides a summary of the base forecasts. Total inter-city corridor travel is forecast to increase from the current level of 11.1 million to 13.2 million in 2010 (20 percent increase) and 17.1 million by 2025 (55 percent increase). The transit market will gain ground on the automobile, attributed to higher growth in the non-resident market. Bus travel is estimated to increase from the current level of 0.69 million to 1.25 million in 2025 (80 percent increase). Rail is also forecast to increase at similar rates, but will still only capture less than half a percent of the total corridor demand.

Commuting, shopping and non-resident travel show strong growth due to high growth rates within the corridor and at YVR. Recreational travel, which is largely dominated by residents of the Lower Mainland will increase at more modest rates due to lower growth rates and an aging population.

Exhibits 5.2 to 5.4 provide plots of the two-way AADT estimated corridor demand by mode for 2001, 2010 and 2025. Note that the current year auto demand compares closely with average mid-corridor station counts. For bus and rail demand, these figures only show passengers travelling to a destination between Horseshoe Bay and Whistler. Passengers headed to points north of Whistler are not included in these estimates.

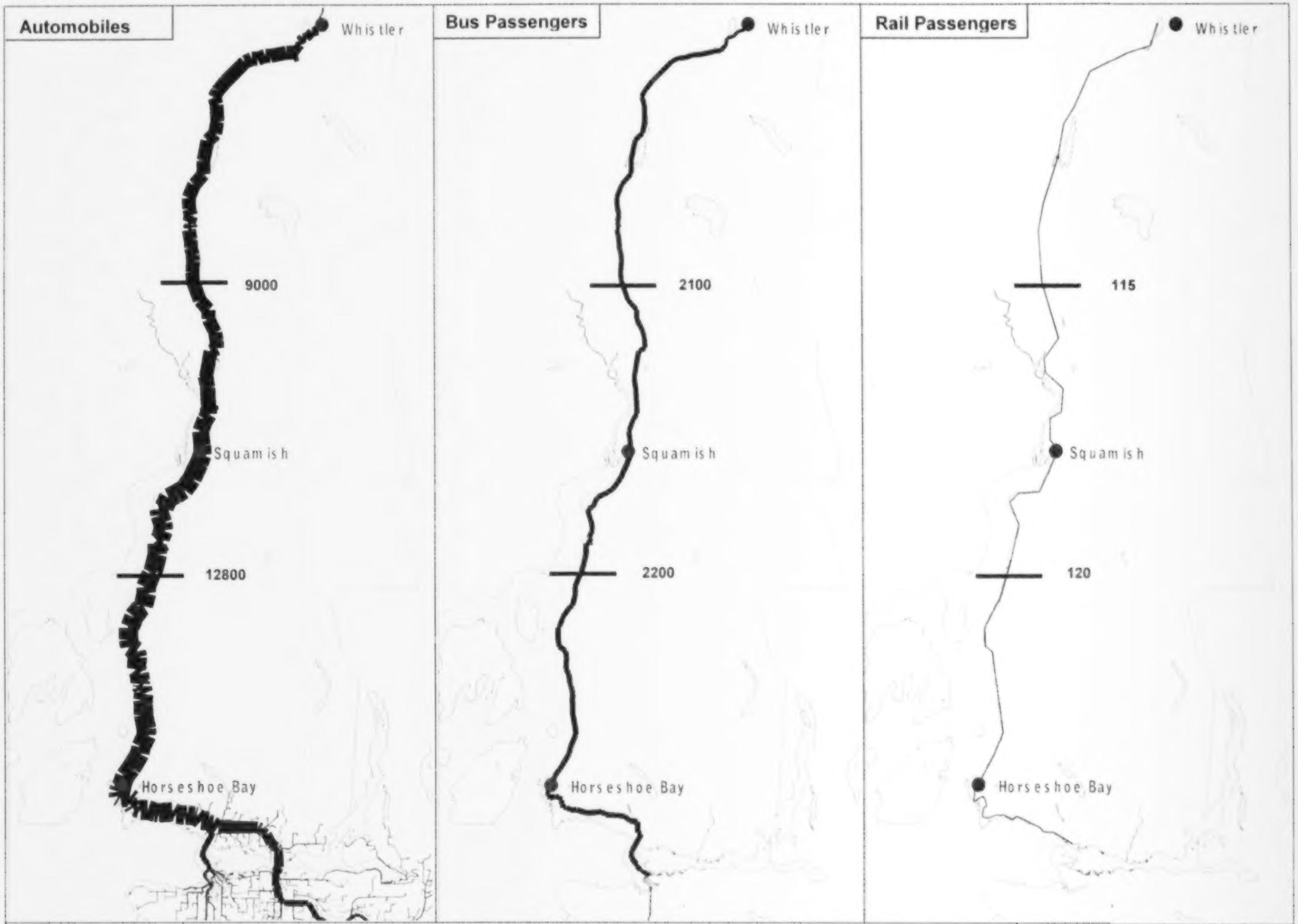
Exhibit 5.1 – STS Baseline Forecast by Mode and Purpose (one-way trips)

	Daily Trips (AADT)			Annual Trips (M)			Percent Growth		Annual Growth	
	2001	2010 Base	2025 Base	2001	2010 Base	2025 Base	2001 to 2010	2001 to 2025	2001 to 2010	2001 to 2025
Trip Mode										
Total Trips	**30,290**	**36,200**	**46,850**	**11.1**	**13.2**	**17.1**	**20%**	**55%**	**2.0%**	**1.8%**
Auto Person	28,300	33,690	43,270	10.3	12.3	15.8	19%	53%	2.0%	1.8%
Auto Driver	12,480	14,930	19,460	4.6	5.4	7.1	20%	56%	2.0%	1.9%
Bus Passenger	1,900	2,390	3,420	0.7	0.9	1.2	26%	80%	2.6%	2.5%
Train Passenger	100	120	170	0.03	0.04	0.06	26%	76%	2.6%	2.4%
Trip Purpose	-	-	-	-	-	-				
Commuting/Business	6,920	8,400	11,680	2.5	3.1	4.3	21%	69%	2.2%	2.2%
Recreation/Social	16,380	18,980	22,600	6.0	6.9	8.2	16%	38%	1.7%	1.4%
Shop/Per. Business	1,950	2,630	3,900	0.7	1.0	1.4	35%	101%	3.4%	2.9%
Non-Resident	5,050	6,200	8,670	1.8	2.3	3.2	23%	72%	2.3%	2.3%
Transit Mode Split	6.6%	6.9%	7.7%	6.6%	6.9%	7.7%				


Automobiles
Whistler
7700
Squamish
10800
Horseshoe Bay
Bus Passengers
Whistler
1650
Squamish
1750
Horseshoe Bay
Rail Passengers
Whistler
90
Squamish
95
Horseshoe Bay

Sea-to-Sky Corridor
Travel Demand Study

Exhibit 5.2 - 2001 Base Corridor Volumes (AADT)



Automobiles

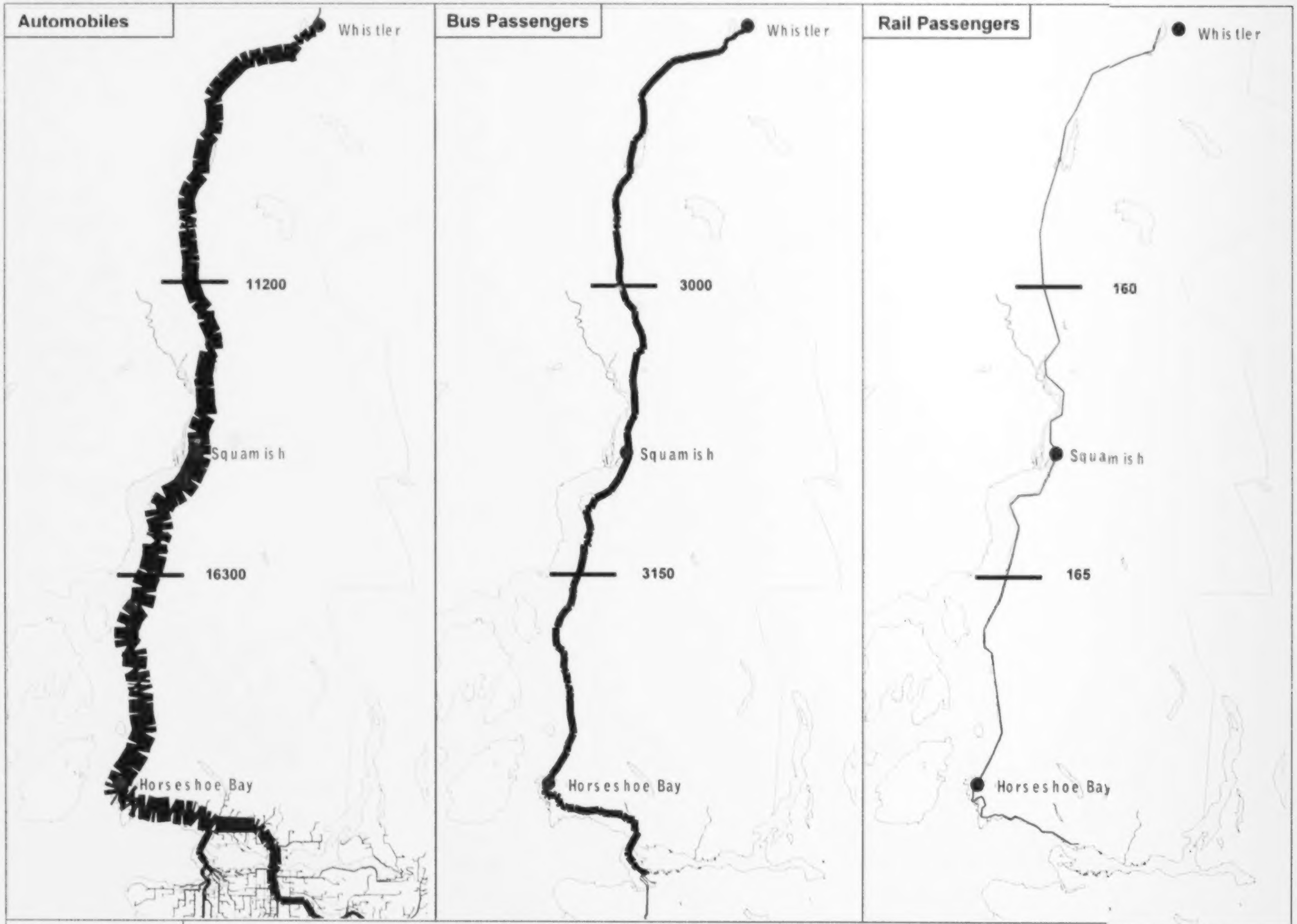
Bus Passengers

Rail Passengers

Whistler
9000
Squamish
12800
Horseshoe Bay
Whistler
2100
Squamish
2200
Horseshoe Bay
Whistler
115
Squamish
120
Horseshoe Bay

Sea-to-Sky Corridor
Travel Demand Study

Exhibit 5.3 - 2010 Corridor Volumes (AADT)


Automobiles
Whistler
11200
Squamish
16300
Horseshoe Bay
Bus Passengers
Whistler
3000
Squamish
3150
Horseshoe Bay
Rail Passengers
Whistler
160
Squamish
165
Horseshoe Bay

Sea-to-Sky Corridor
Travel Demand Study

Exhibit 5.4 - 2025 Base Corridor Volumes (AADT)

5.2 Corridor Option Forecasts

The next stage involved the development of demand forecasts for the four options:

- ☐ Option 1 – Highway Emphasis
- ☐ Option 2 – Medium Rail Investment
- ☐ Option 3 – Maximum Rail Investment
- ☐ Option 4 – Passenger-Only Ferry/Bus

Exhibit 5.5 provides a summary of the travel cost and time information for each option as they were presented to the survey respondents.

Exhibit 5.5 – Option Out-of-Pocket Costs and Travel Time

	Option 1 Hwy Emp	Option 2 Med Rail	Option 3 Max Rail	Option 4 Pass Ferry/Bus
Daily Frequency	Anytime	3 NB, 3 SB	3 NB, 3 SB	4 NB, 4 SB
Average Out-of-Pocket Costs (excl. access costs)				
Vancouver-Squamish	$8	$25	$35	$25
Vancouver-Whistler	$16	$50	$70	$35
Average Travel Time (travel+ wait time, excl. access time)				
Vancouver-Squamish	55 min	115 min	100 min	65 min
Vancouver-Whistler	100 min	185 min	160 min	160 min

Corridor option forecasts were developed using the concept testing information and verified using secondary methods. The telephone and onsite surveys asked respondents about their likelihood of using the new services according to a five scale index (definitely, probably, might or might not, probably not, definitely not). Respondents that would "definitely" or "probably" use the service, were asked how many trips in either previous season would they have taken by the new option. This data was analyzed and used to develop latent demand and mode shift factors by market segment (see discussion in Appendix E on latent demand). A series of low and high factors were developed for each option and then confirmed with estimates prepared using an experienced-based method.

Exhibit 5.6 and 5.7 provide a summary of the AADT and annual forecasts for each option in 2010 and 2025. Exhibit 5.8 compares the mid-corridor AADT volumes by mode. The following sections provide a short discussion on the forecasting assumptions and demand results for each option.

5.2.1 Option 1 – Highway Emphasis

The Highway Emphasis option was the only option that showed the potential to induce travel demand among the concepts that were tested. Low and high latent demand factors were developed for each trip purpose by sub-area. Note that the four lane highway showed very little impact on non-resident travel. The latent demand factors ranged between 1.05 and 1.20 and increased overall demand by 6.5 percent relative to baseline conditions. With respect to modal diversion, recreational bus trips were the only market segment to show some diversion to the automobile. This diversion affect was most notable in the winter season, which could be explained by current safety concerns.

Under the highway emphasis option, corridor auto demand would increase by six to seven percent over baseline conditions. AADT vehicle volumes between Horseshoe Bay and Squamish would increase from current day levels of 10,800 to approximately 17,500 in 2025. Between Squamish and Whistler AADT vehicle volumes would reach 12,000 (versus 7,700 today). Exhibits 5.9 and 5.10 show the two-way AADT corridor demand by mode in 2010 and 2025 for this option. It should be restated that the highway emphasis option (and the remaining options) assumed that no road tolls would be applied to the upgraded highway.

5.2.2 Option 2 and 3 – Medium and Maximum Rail Investment

For both rail options, the concept testing data was used to develop base demand multipliers and modal diversion factors for each market segment. This analysis indicated that for medium rail, existing resident demand could increase by a factor of 4.5 to 7.5. This increase would be in the recreational market as fare levels appear to be too high for the regular commuting market. Fare levels were established on the assumption that train service should operate on a commercial (non-subsidized) basis. Diversion from recreational bus trips was estimated at 6.5 percent, with the remaining diversion coming from the auto. Non-resident rail demand showed potential increases by a factor of 2.5 to 3 over existing levels with similar diversion rates from bus.

The maximum rail concept seemed to show slightly higher multipliers for resident demand (e.g. 6.5 to 8.5) than the medium rail concept. However, this option showed lower multipliers for non-residents (e.g. 1.5 to 2). Modal diversion rates were similar to the medium rail option.

Applying these factors to the existing rail demand of 35,000 annual trips (10,000 resident and 25,000 non-resident) produced low and high rail estimates for each option in 2001. For medium rail, the ridership is estimated at between 100,000 and 150,000 annual trips, or 270 to 410 daily one-way trips (average of 340 trips). For maximum rail, ridership is estimated at 100,000 to 140,000 annual trips, or 270 to 380 daily one-way trips (average of 325 trips). Assuming six train trips per day (three northbound and three southbound), this translates to average loadings of approximately 45 to 70 passengers (equivalent to less than two bus loads).

In order to verify these estimates, the recreational origin/destination matrices were reviewed. Applying reasonable mode share factors to OD pairs produced an annual resident estimate of between 80,000 and 100,000 annual trips. Assuming non-resident trips would increase at stated levels, this translates to 120,000 to 200,000 annual trips.

For 2010 and 2025, midpoint demand multipliers were used to forecast demand. For the medium rail concept, the midpoint demand is estimated at approximately 160,000 annual trips in 2010, increasing to 210,000 trips in 2025 (430 and 570 daily one-way trips, respectively). For the maximum rail concept, the midpoint demand is estimated at 150,000 trips in 2010 and 190,000 annual trips in 2025 (410 and 520 daily one-way trips, respectively). The rail options increase inter-city transit mode split from 6.9 to 7.5 percent in 2010 and 7.7 to 8.1 percent in 2025. Exhibits 5.11 to 5.14 show the two-way AADT corridor demand by mode in 2010 and 2025 for these options.

5.2.3 Option 4 – Passenger-Only Ferry/Bus

The passenger-only ferry/bus option was evaluated using a slightly different approach from rail. As no regular service is currently available, demand was determined directly from modal diversion rates. Information from the concept testing indicated a current year level of demand for residents in the range of 220,000 to 270,000 per year. Ninety percent of this demand would come from auto and the remaining ten percent from bus. For non-residents, demand levels were estimated at between 80,000 and 120,000 annual trips. Approximately 65 percent of this demand would come from auto and 35 percent from bus. The total demand based on this approach is estimated at between 300,000 and 390,000 annual trips for the current year.

As commuters showed some interest in the ferry, it was possible to verify these estimates using the existing demand matrices and information from the TransLink model for West Coast Express (WCE). Note that the WCE caters to the commuting market and provides different service characteristics and a lower fare structure than the ferry service. To adjust for this, standard fare elasticity factors can be applied to the mode share estimates produced by the TransLink model.

For all trips between Mission and Vancouver, the average mode share is approximately 17 percent. The trip between Mission and Vancouver on WCE takes approximately 70 minutes compared to a proposed 45 minutes for the ferry (excluding wait time). However, the proposed ferry fare is more than three times the regular WCE cash fare between Mission and Vancouver. Applying a standard fare elasticity factor for commuter travel of –0.3, and accounting for the difference in travel time would suggest that the ferry service might capture as much as eight percent of the commuting market between Squamish and Vancouver. Similar market share estimates were developed for other OD pairs by trip purpose.

The matrix-based method produced an annual estimate of resident ferry demand of approximately 300,000 trips as a high estimate (210,000 recreation, 65,000 commuting and 25,000 shop or personal business). For the low range, the high estimate was factored by 0.75 to account for the lower frequency and reliability of the ferry service. For non-residents it was assumed that 10-15 percent of those staying in Vancouver (primarily in downtown hotels) would use the ferry or 80,000 to 120,000 annual trips. Note the current bus services between Vancouver and Whistler capture more than 50 percent of this market. This independent approach produced an estimate of between 305,000 and 420,000.

Therefore, it was assumed that a preliminary range of 2001 demand for the proposed ferry/bus service is between 300,000 and 400,000 annual trips or 820 to 1,100 daily trips. Assuming eight sailings per day (four each way), this would translate into an average load of between 100 and 140 passengers.

In order to forecast future ferry demand, a series of 2001 demand matrices were developed based on survey respondent origin/destination and trip purpose information. These matrices were controlled to an annual 2001 demand of 350,000 trips (midpoint of the low and high forecast). Forecasts for 2010 and 2025 ferry demand were developed by applying the baseline growth factors by trip purpose. This new demand was subtracted from the auto and bus modes based on the diversion rates mentioned above.

For 2010, the ferry/bus option is forecast to attract 420,000 annual passengers (1,150 daily one-way trips). Annual ridership is forecast to increase to 550,000 by 2025 (1,500 daily one-way trips). The ferry/bus option appears to have the most significant impact on corridor transit mode split of the four options. Relative to the base, inter-city transit mode split would increase from 6.9 to 9.7 percent in 2010, and 7.7 to 10.4 percent in 2025. Exhibits 5.15 and 5.16 show the two-way AADT corridor demand by mode in 2010 and 2025 for this option.

Exhibit 5.6 – 2010 STS Option Forecasts by Mode and Purpose

	Daily Trips (AADT)						Annual Trips					
	2001	2010 Base	2010 Opt1 Hwy Emp	2010 Opt2 Med Rail	2010 Opt3 Max Rail	2010 Opt4 Pass Ferry/Bus	2001	2010 Base	2010 Opt1 Hwy Emp	2010 Opt2 Med Rail	2010 Opt3 Max Rail	2010 Opt4 Pass Ferry/Bus
Trip Mode												
Total Trips	**30,290**	**36,200**	**38,570**	**36,200**	**36,200**	**36,200**	**11.06**	**13.21**	**14.08**	**13.21**	**13.21**	**13.21**
Auto Person	28,290	33,690	36,160	33,500	33,500	32,700	10.33	12.30	13.20	12.23	12.23	11.93
Auto Driver	12,480	14,930	15,980	14,860	14,860	14,500	4.55	5.45	5.83	5.42	5.42	5.29
Bus Passenger	1,900	2,390	2,290	2,270	2,290	2,230	0.69	0.87	0.84	0.83	0.84	0.82
Train Passenger	100	120	120	430	410	120	0.03	0.04	0.04	0.16	0.15	0.04
Ferry Passenger	-	-	-	-	-	1,150	-	-	-	-	-	0.42
Trip Purpose												
Commuting/Business	6,920	8,400	8,900	8,400	8,400	8,400	2.53	3.07	3.25	3.07	3.07	3.07
Recreation/Social	16,380	18,980	20,560	18,980	18,980	18,980	5.98	6.93	7.50	6.93	6.93	6.93
Shop/Per. Business	1,950	2,630	2,920	2,630	2,630	2,630	0.71	0.96	1.07	0.96	0.96	0.96
Non-Resident	5,050	6,200	6,200	6,200	6,200	6,200	1.84	2.26	2.26	2.26	2.26	2.26
Transit Mode Split	6.6%	6.9%	6.2%	7.5%	7.5%	9.7%	6.6%	6.9%	6.2%	7.5%	7.5%	9.7%

Exhibit 5.7 – 2025 STS Option Forecasts by Mode and Purpose

	Daily Trips (AADT)						Annual Trips					
	2001	2025 Base	2025 Opt1 Hwy Emp	2025 Opt2 Med Rail	2025 Opt3 Max Rail	2025 Opt4 Pass Ferry/Bus	2001	2025 Base	2025 Opt1 Hwy Emp	2025 Opt2 Med Rail	2025 Opt3 Max Rail	2025 Opt4 Pass Ferry/Bus
Trip Mode												
Total Trips	**30,290**	**46,850**	**49,760**	**46,850**	**46,850**	**46,850**	**11.06**	**17.10**	**18.16**	**17.10**	**17.10**	**17.10**
Auto Person	28,290	43,270	46,300	43,040	43,050	41,980	10.33	15.79	16.90	15.71	15.71	15.32
Auto Driver	12,480	19,460	20,780	19,370	19,380	18,910	4.55	7.10	7.58	7.07	7.08	6.90
Bus Passenger	1,900	3,420	3,290	3,240	3,280	3,190	0.69	1.25	1.20	1.18	1.20	1.17
Train Passenger	100	170	170	570	520	170	0.03	0.06	0.06	0.21	0.19	0.06
Ferry Passenger	-	-	-	-	-	1,500	-	-	-	-	-	0.55
Trip Purpose												
Commuting/Business	6,920	11,680	12,350	11,680	11,680	11,680	2.53	4.26	4.51	4.26	4.26	4.26
Recreation/Social	16,380	22,600	24,430	22,600	22,600	22,600	5.98	8.25	8.92	8.25	8.25	8.25
Shop/Per. Business	1,950	3,900	4,320	3,900	3,900	3,900	0.71	1.42	1.58	1.42	1.42	1.42
Non-Resident	5,050	8,670	8,670	8,670	8,670	8,670	1.84	3.16	3.16	3.16	3.16	3.16
Transit Mode Split	6.6%	7.7%	7.0%	8.1%	8.1%	10.4%	6.6%	7.6%	6.9%	8.1%	8.1%	10.4%

Exhibit 5.8 – Corridor AADT Screenline Volumes by Mode

	Daily Trips (AADT)										
	2001	2010 Base	2010 Opt1 Hwy Emp	2010 Opt2 Med Rail	2010 Opt3 Max Rail	2010 Opt4 Pass Ferry/Bus	2025 Base	2025 Opt1 Hwy Emp	2025 Opt2 Med Rail	2025 Opt3 Max Rail	2025 Opt4 Pass Ferry/Bus
Squamish to Whistler (10 km N. of Squamish)											
Vehicle Volumes	7,700	9,000	9,700	9,000	9,000	8,800	11,200	12,000	11,100	11,100	10,900
Bus Passenger	1,650	2,100	2,000	1,950	2,000	1,950	3,000	2,950	2,850	2,850	2,800
Train Passenger	90	115	115	390	350	115	160	160	530	460	160
Ferry/Bus Passenger						750					950
Horseshoe Bay to Squamish (near Furry Creek)											
Vehicle Volumes	10,800	12,800	13,700	12,700	12,700	12,400	16,300	17,500	16,200	16,200	15,700
Bus Passenger	1,750	2,200	2,100	2,100	2,100	2,100	3,200	3,050	2,950	3,050	2,950
Train Passenger	95	120	120	420	390	120	165	165	560	500	165
Ferry/Bus Passenger						1,150					1,500

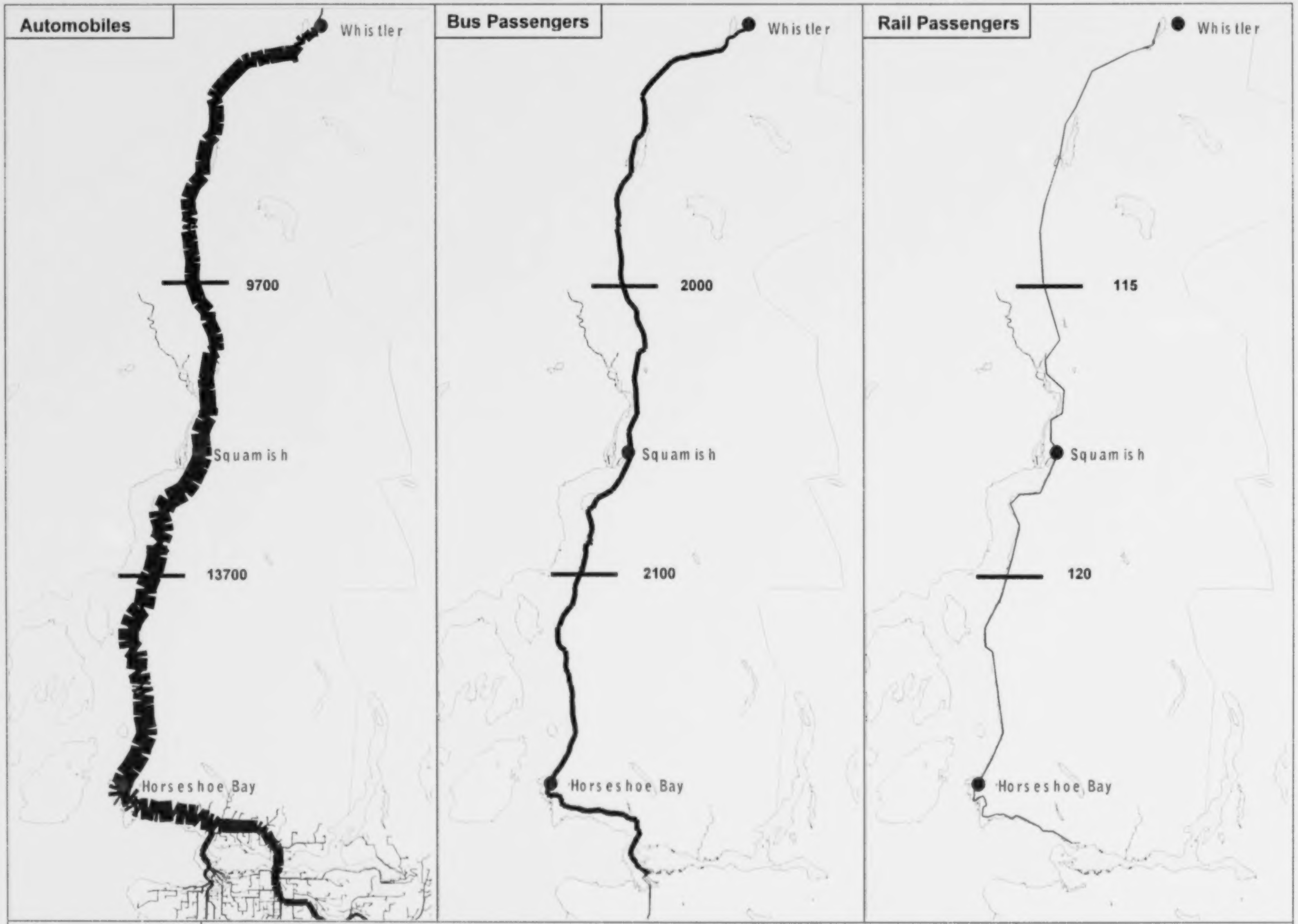

Automobiles
Whistler
9700
Squamish
13700
Horseshoe Bay
Bus Passengers
Whistler
2000
Squamish
2100
Horseshoe Bay
Rail Passengers
Whistler
115
Squamish
120
Horseshoe Bay

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Exhibit 5.9 - 2010 Option 1 Model Volumes (AADT)

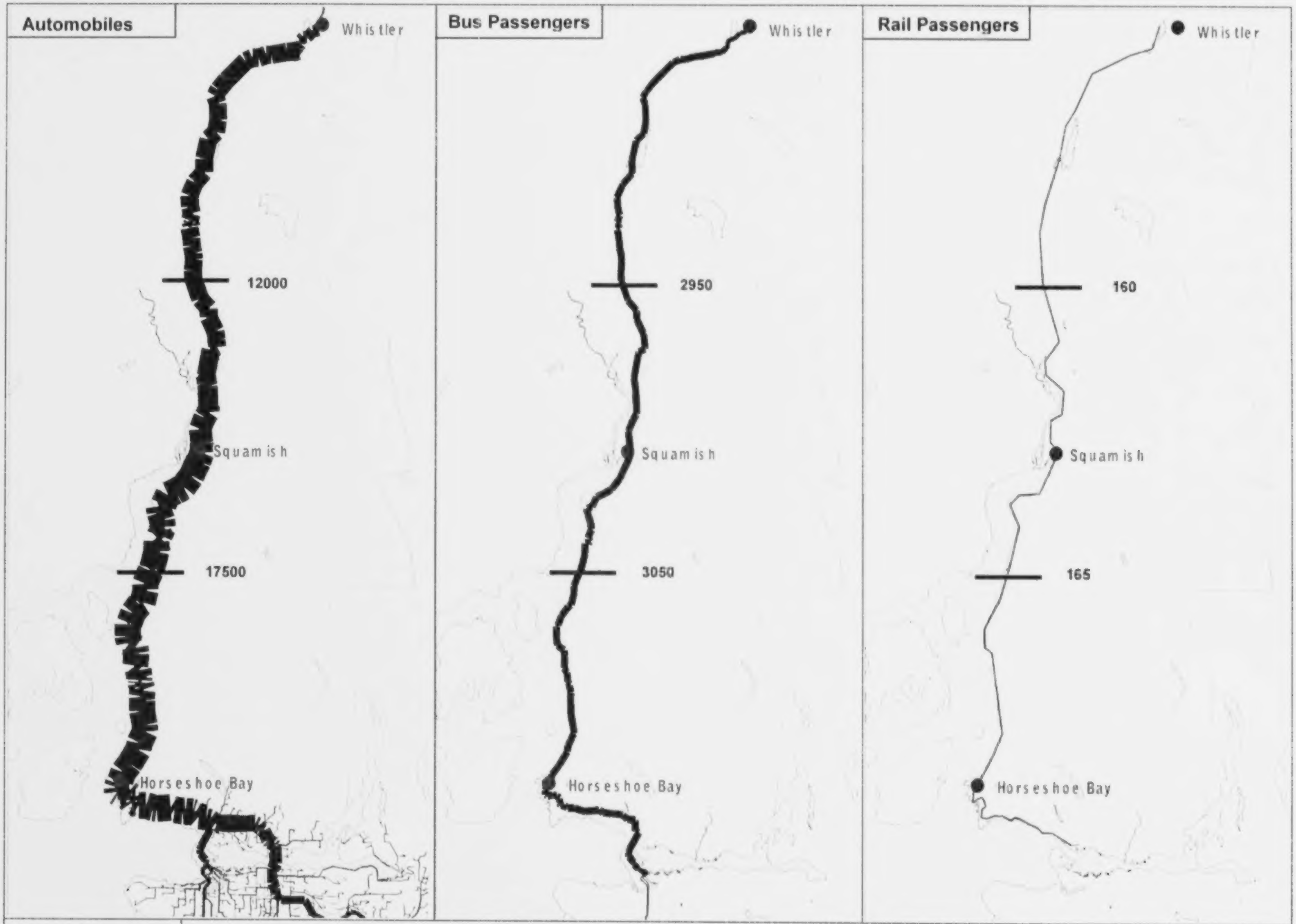
Automobiles
Whistler
12000
Squamish
17500
Horseshoe Bay
Bus Passengers
Whistler
2950
Squamish
3050
Horseshoe Bay
Rail Passengers
Whistler
160
Squamish
165
Horseshoe Bay

Exhibit 5.10 - 2025 Option 1 Model Volumes (AADT)

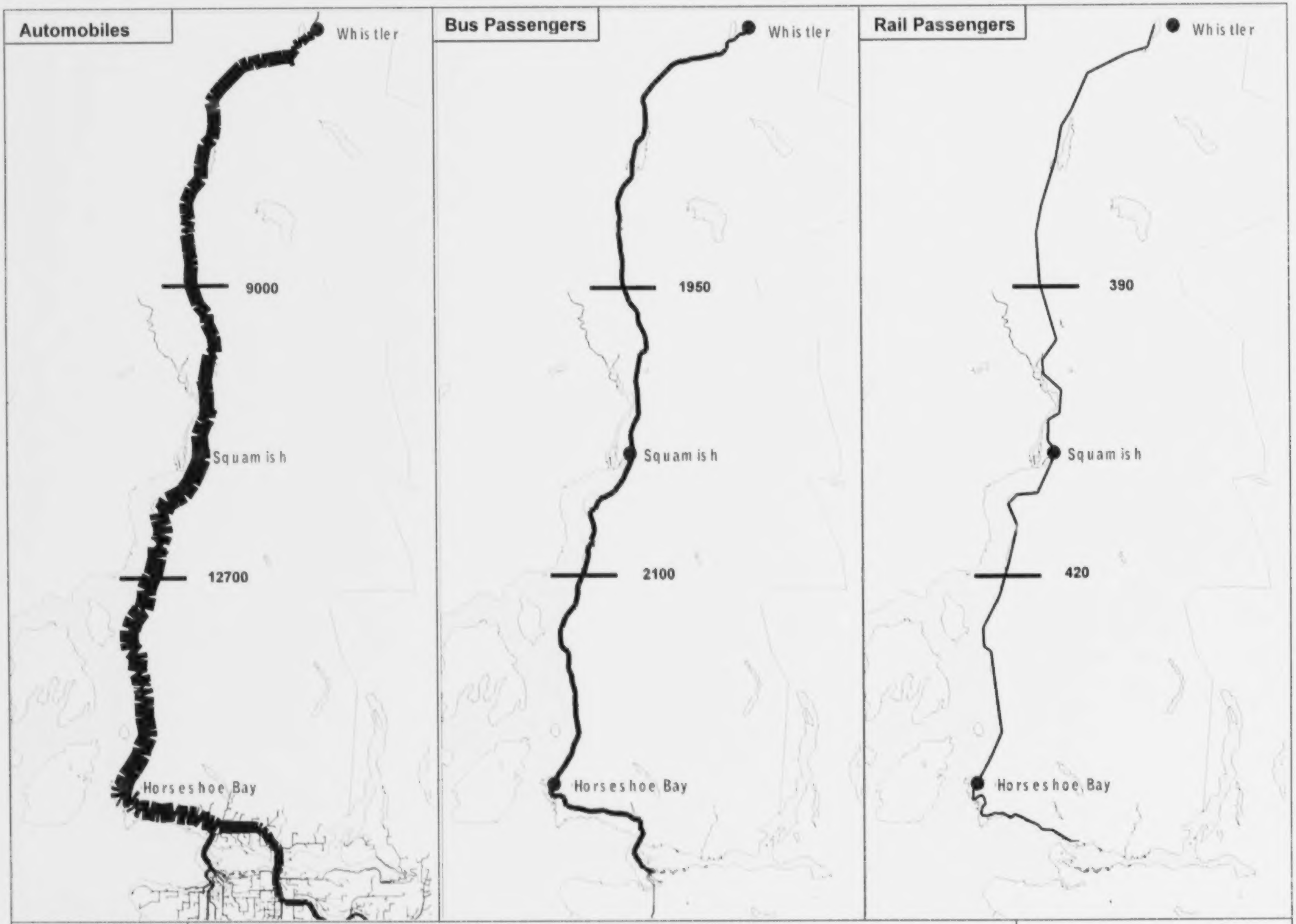
Automobiles
Whistler
9000
Squamish
12700
Horseshoe Bay
Bus Passengers
Whistler
1950
Squamish
2100
Horseshoe Bay
Rail Passengers
Whistler
390
Squamish
420
Horseshoe Bay

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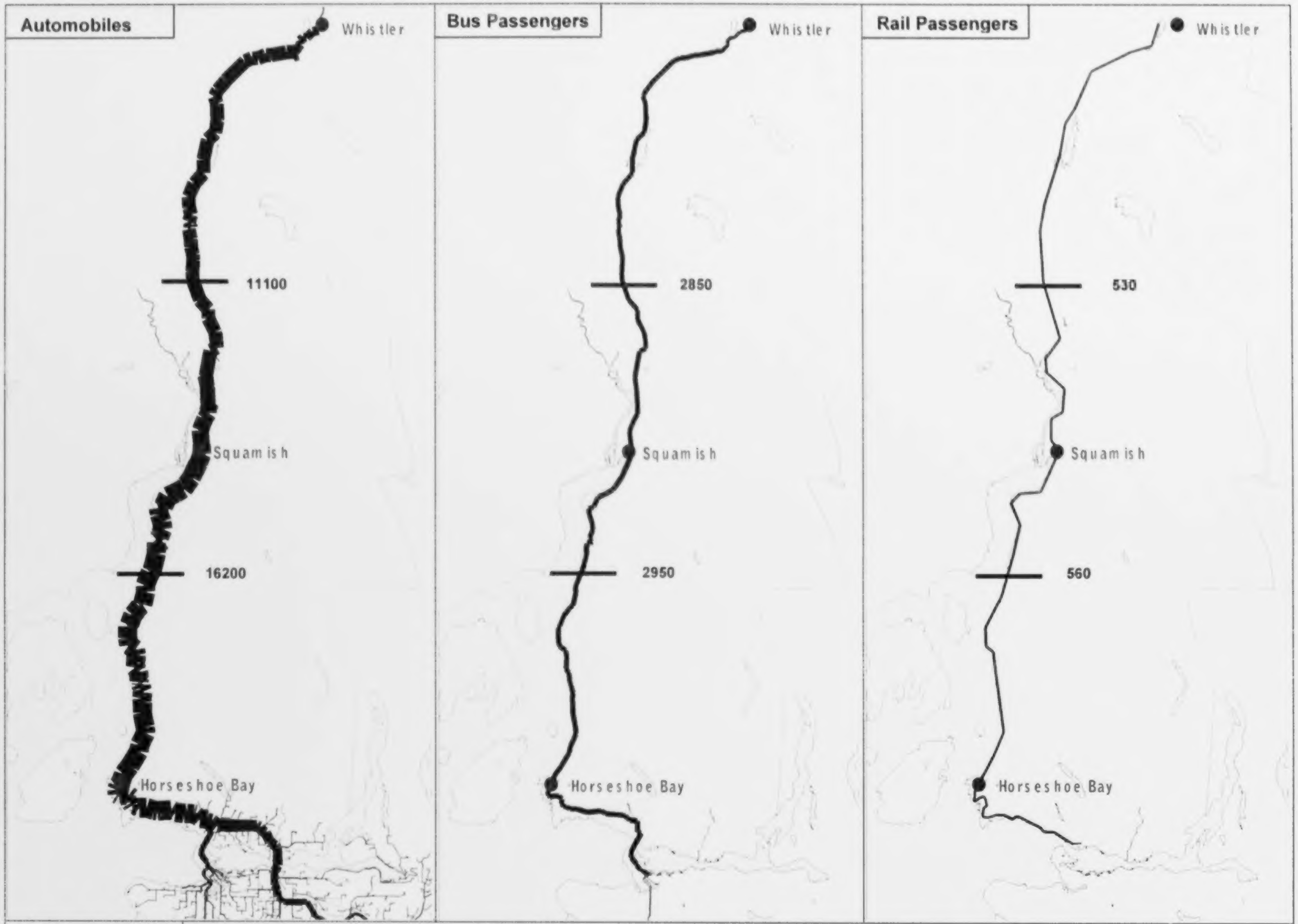
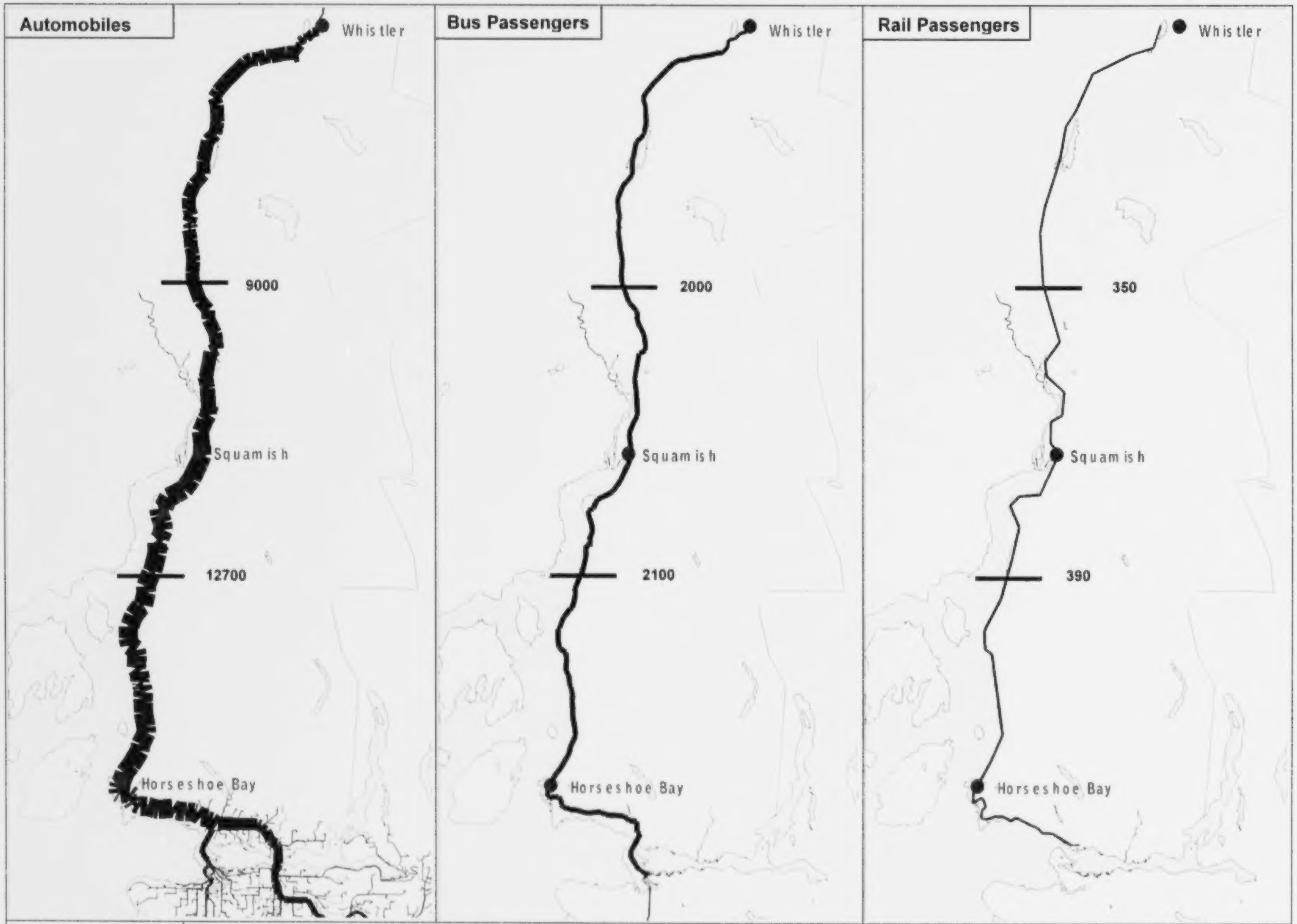
Exhibit 5.11 - 2010 Option 2 Model Volumes (AADT)


Automobiles
Whistler
11100
Squamish
16200
Horseshoe Bay
Bus Passengers
Whistler
2850
Squamish
2950
Horseshoe Bay
Rail Passengers
Whistler
530
Squamish
560
Horseshoe Bay

Sea-to-Sky Corridor
Travel Demand Study

Exhibit 5.12 - 2025 Option 2 Model Volumes (AADT)


Automobiles
Whistler
9000
Squamish
12700
Horseshoe Bay
Bus Passengers
Whistler
2000
Squamish
2100
Horseshoe Bay
Rail Passengers
Whistler
350
Squamish
390
Horseshoe Bay

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Travel Demand Study

Exhibit 5.13 - 2010 Option 3 Model Volumes (AADT)

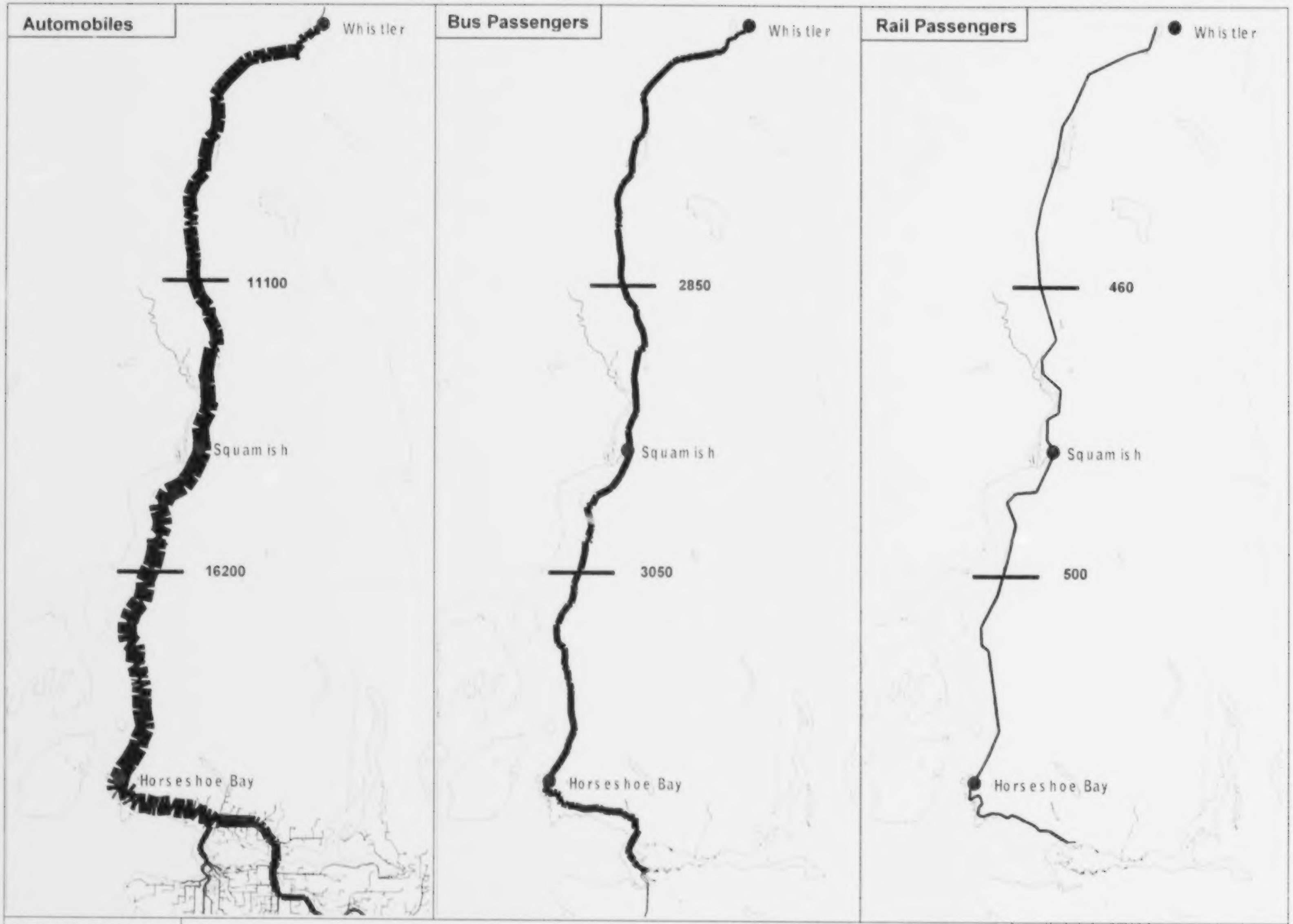
Automobiles
Whistler
11100
Squamish
16200
Horseshoe Bay
Bus Passengers
Whistler
2850
Squamish
3050
Horseshoe Bay
Rail Passengers
Whistler
460
Squamish
500
Horseshoe Bay

Exhibit 5.14 - 2025 Option 3 Model Volumes (AADT)

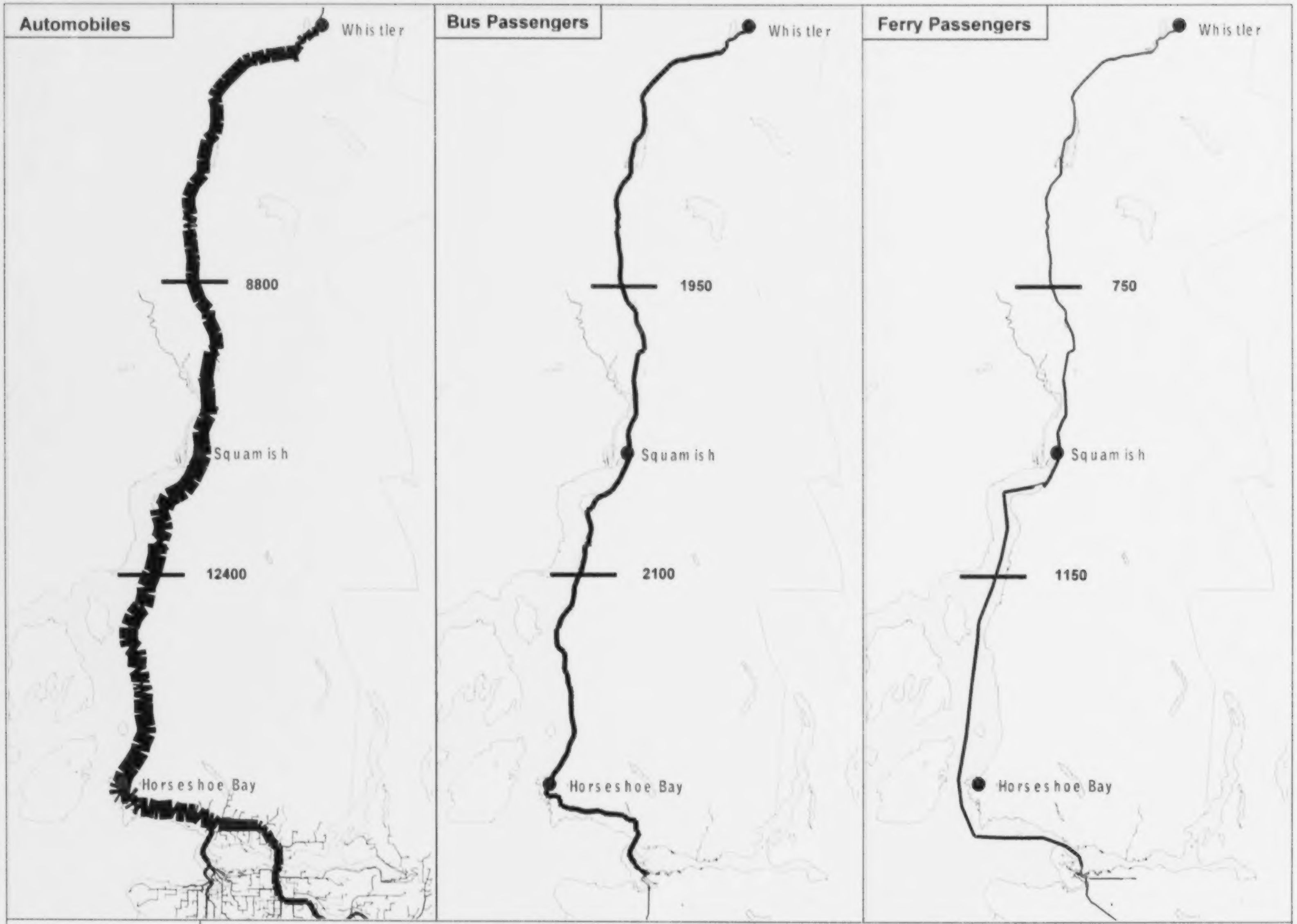
Automobiles
Whistler
8800
Squamish
12400
Horseshoe Bay
Bus Passengers
Whistler
1950
Squamish
2100
Horseshoe Bay
Ferry Passengers
Whistler
750
Squamish
1150
Horseshoe Bay

Exhibit 5.15 - 2010 Option 4 Model Volumes (AADT)

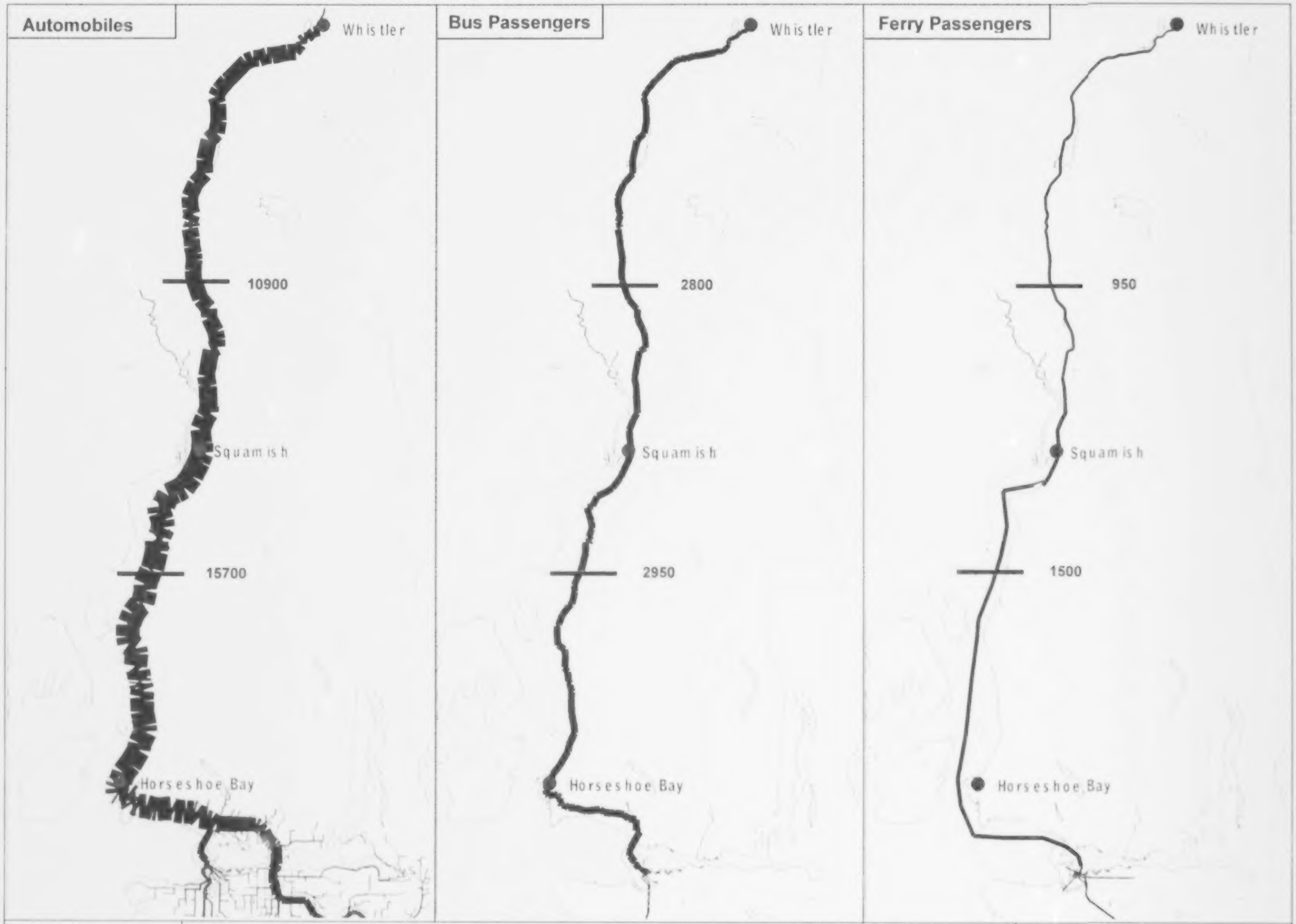
Automobiles
Whistler
10900
Squamish
15700
Horseshoe Bay
Bus Passengers
Whistler
2800
Squamish
2950
Horseshoe Bay
Ferry Passengers
Whistler
950
Squamish
1500
Horseshoe Bay

Exhibit 5.16 - 2025 Option 4 Model Volumes (AADT)

5.3 Evaluation of Options

The cost estimates and traffic and passenger forecasts described in the previous sections provide a basis for a high level evaluation of the four corridor options. As the primary focus of this study was on demand estimation and travel forecasting, the evaluation of options was limited to an assessment of the financial accounts (costs and revenues) and the travel time benefits for corridor users. A detailed Multiple Account Evaluation (MAE) was beyond the scope of this study (e.g. financial, customer, environmental, social and economic development accounts). Also note that accident cost savings and the temporary economic impacts of highway construction were not examined.

5.3.1 Financial

Exhibit 5.17 provides a summary of the capital, operating and maintenance costs and potential fare revenues for the four options. Capital costs are annualized for illustrative purposes in order to show net annual costs (costs minus revenues). Note that these costs and revenues could be shared between the pubic and private sectors depending on the delivery model. The passenger-only ferry/bus option has the lowest annual costs and highest fare revenue potential of the four options, resulting in a net annual cost of $13.9 million. The net annual cost of the other options range between $60 and $80 million as they involve significant investment in highway and rail infrastructure.

Exhibit 5.17 – Financial Summary of Options

	Option 1 - Highway Emphasis	Option 2 - Medium Rail	Option 3 - Maximum Rail	Option 4 - Passenger Ferry/Bus
Capital ($M)				
Highway Safety Improvements	$ 206.0	$ 206.0	$ 206.0	$ 206.0
4 Laning to Squamish	$ 750.0			
Minimum Rail Investment	$ 40.0			$ 40.0
Medium Rail Investment		$ 318.0		
Maximum Rail Investment			$ 568.0	
Ferry berths and vessels				$ 25.3
Total Capital	$ 996.0	$ 524.0	$ 774.0	$ 271.3
Annualized Capital[1]	$ 73.6	$ 47.7	$ 65.9	$ 21.7
Annual Operating/Maintenance ($M)				
Highway	$ 0.85			
Rail		$ 23.0	$ 23.0	
Ferry and Bus				$ 7.45
Total Annual O&M	$ 0.85	$ 23.0	$ 23.0	$ 7.45
Annual Fare Revenue ($M)				
2010		($ 7.4)	($ 9.7)	($ 13.2)
2025		($ 9.7)	($ 12.3)	($ 17.3)
Average Annual Fare Revenue		($ 8.6)	($ 11.0)	($ 15.3)
Average Annual Net Cost ($M)	**$ 74.4**	**$ 62.2**	**$ 77.9**	**$ 13.9**

1. Capital is discounted at 6% over a 30 year period for highway and rail tunnel infrastructure and a 15 year period for rail rolling stock, station and track upgrades, ferries and terminal infrastructure.

5.3.2 *Travel Time Benefits*

Each of the four options offer an improved level of service and travel time savings in the corridor. The EMME/2 model was used to quantify the travel time savings (or benefits) for each option by travel mode. Travel time benefits are shown in Exhibit 5.18 and are based on the annual time savings for existing and new users (based on the change in consumer surplus). Note that travel time benefits for ferry passengers were not estimated, as the change in consumer surplus is hard to define for a new transportation mode. Also note that the medium rail option produced no travel time savings for train passengers. However, each of these options includes highway improvements between Squamish and Whistler, which produce auto and bus passenger travel time benefits.

Exhibit 5.18 – Summary of Travel Time Benefits

	Option 1 - Highway Emphasis	Option 2 - Medium Rail	Option 3 - Maximum Rail	Option 4 - Passenger Ferry/Bus
Annual Travel Time Benefits (hours)				
Auto and bus passengers				
2010	3,314,200	635,830	635,830	620,500
2025	4,164,650	782,925	782,925	768,325
Train/Ferry passengers				
2010	-	-	36,500	n.a.
2025	-	-	48,200	n.a.
Total Annual Travel Time Benefits ($M)				
2010	$ 33.1	$ 6.4	$ 6.7	$ 6.2
2025	$ 41.6	$ 7.8	$ 8.3	$ 7.7
Avg. Annual Travel Time Benefits	$ 37.4	$ 7.1	$ 7.5	$ 6.9

1. Value of time is assumed to be $10 per hour for the travel time benefit calculations

This analysis shows that the highway emphasis option could produce travel time benefits between $33 and $42 million depending on the time horizon. The rail and passenger-only ferry/bus options would generate between $6 and $8 million in travel time benefits. As ferry passenger travel time benefits were not estimated, the travel benefits for this option should be considered conservative.

The annual travel benefits generated for the highway emphasis and passenger-only ferry/bus options represent approximately 50 percent of their average annual costs. As mentioned earlier, accident cost savings have not been estimated and could exceed the travel time benefits. With respect to the rail options, annual travel time benefits represent approximately 10 percent of the annual costs (note that the majority of these benefits are generated from the highway safety improvements).

5.3.3 Travel Cost per Trip

Another way to compare the options is to examine the cost per trip by the respective modes. This analysis isolates the various components of each option and helps to determine if they have merit as standalone projects. Note that this analysis does not include existing operating and maintenance costs, and therefore represents incremental costs for the highway upgrades and rail investments. Exhibit 5.19 provides a summary of the average annual capital and operating/maintenance costs, annual trips and average cost per trip. The information is shown for the 2010 and 2025 time horizons. The average cost per trip can be interpreted as the amount that would have to be charged per trip to recover the cost of the investment.

For the highway emphasis option, the average cost per trip for auto and bus passengers would be $5 in 2010 dropping to $3.9 in 2025 (assuming the cost is shared according to person trips and not vehicle trips). The cost per train passenger benefiting from the minimum rail investment would be more than $100 in 2010, dropping to approximately $70 in 2025.

For the medium and maximum rail options, the average cost per trip for auto and bus passengers would be approximately $1 to cover the highway safety improvements. For medium rail, the average cost per train trip would be approximately $350 in 2010 and $265 in 2025. A $50 fare level between Vancouver and Whistler was assumed for the medium rail option. This means that fares would have to be increased five to seven fold (with no loss in ridership due to the fare increase) before the service would breakeven. Note that at this fare level, the demand levels would be significantly reduced. The cost per ride for maximum rail is notably higher than for medium rail (e.g. approximately $490 in 2010 and $390 in 2025). This analysis demonstrates that both rail service options would require heavy public subsidies.

The passenger-only ferry/bus option includes the same highway safety improvements as the rail options resulting in similar costs per trip. For ferry/bus passengers, the cost per trip is estimated at $24 in 2010, dropping to less than $20 by 2025. For this study, a $25 fare level between Vancouver and Squamish was assumed. Based on this analysis, it appears that the passenger-only ferry/bus service offers some potential as an independent project. It is important to note that reliability may be a factor on this service, which may affect the overall costs and demand levels. If this option is to be pursued any further, additional demand analysis is recommended once the service attributes and target markets are defined in more detail.

Exhibit 5.19 – Average Cost per Trip by Passenger Mode

	Option 1 - Highway Emphasis		Option 2 - Medium Rail		Option 3 - Maximum Rail		Option 4 - Passenger Ferry/Bus	
Avg. Annual Capital and O&M Costs ($M)[1]								
Highway	$ 70.3		$ 15.0		$ 15.0		$ 15.0	
Rail	$ 4.1		$ 55.7		$ 73.9		$ 4.1	
Passenger-only Ferry							$ 10.1	
Total Net Annual Costs	$ 74.4		$ 70.7		$ 88.9		$ 29.2	
	2010	**2025**	**2010**	**2025**	**2010**	**2025**	**2010**	**2025**
Annual Trips (M)								
Auto and bus passengers	14.04	18.10	13.05	16.89	13.06	16.91	12.75	16.49
Train passengers	0.04	0.06	0.16	0.21	0.15	0.19	0.04	0.06
Ferry passengers							0.42	0.55
Total passengers	14.08	18.16	13.21	17.10	13.21	17.10	13.21	17.10
Avg. Cost per Trip ($)								
Auto and bus passengers	$ 5.0	$ 3.9	$ 1.1	$ 0.9	$ 1.1	$ 0.9	$ 1.2	$ 0.9
Train passengers	$ 102.5	$ 68.3	$ 348.1	$ 265.2	$ 492.7	$ 388.9	$ 102.5	$ 68.3
Ferry passengers							$ 24.0	$ 18.4

1. Capital is discounted at 6% over a 30 year period for highway and rail tunnel infrastructure and a 15 year period for rail rolling stock, station and track upgrades, ferries and terminal infrastructure.

5.4 Demand Implications of Highway Tolls

Given the possibility that tolls could be implemented to pay for future highway upgrades, information on potential trip suppression and mode diversion was reviewed for applicability to the Sea-to-Sky corridor. Note that the majority of work in this area has focused on urbanized areas, where trip characteristics are quite different. The Coquihalla Highway and Highway 407 in Toronto are examples of an inter-city, or inter-regional toll facility that could provide useful information for the Sea-to-Sky corridor. Unfortunately, toll diversion information is not available for the Coquihalla Highway and information on Highway 407 is strictly confidential at this stage.

In a typical urban setting, the application of a toll on an existing facility can produce the following changes in travel behaviour:

- Diversion to a "free" alternate route
- Diversion to a different mode (e.g. bus or rail)
- Increased car-pooling using the existing facility
- Reduction in trip making between the areas affected by the toll and/or changes in (trip substitution can occur between areas not impacted by the toll)
- Changes in housing and job locations by individuals to avoid the toll
- Land use development changes

With respect to the above list of travel behaviour changes, it is likely that carpooling and reduced trip making could have the greatest impact on Sea-to-Sky corridor traffic volumes. With significant improvements in bus, rail or marine supply in the corridor coupled with substantial road tolls, there is a potential for diversion to other modes. Note however, that doubling the current bus and rail usage would remove less than 1,000 vehicles per day from the section of highway between Vancouver and Squamish (the current mid-corridor AADT is approximately 11,000).

Changes in housing or job location and land use affects are long run effects that are difficult to quantify. Also, these effects may be less pronounced on this corridor due to the lower proportion of commuter use than in a typical urban setting. Finally, a feasible alternate route does not exist, and hence, route diversion is not a factor.

It is important to note that each of these effects will vary according to trip purpose and time of day. As such, extensive data collection efforts are required to determine the characteristics and tolerance levels of existing and potential users. This information is used to develop toll diversion curves that can be applied to specific user classes.

In the absence of original data, travel elasticities from other studies can be used to develop very preliminary indications of modified travel demand due to tolls. Elasticity is defined as the percentage change in the consumption of a consumer good such as road space resulting from a one-percent change in the trip generalized cost or other related characteristic (e.g. travel time, service quality, etc.). The generalized cost of a trip may refer to all or some of the aspects of the trip including travel time and variable costs such as fuel and vehicle maintenance. For the purpose of the Sea-to-Sky highway corridor, it is most appropriate to examine the change in vehicle demand resulting from changes in out-of-pocket costs or fuel prices as they can be assumed to represent travel costs for the entire trip. Toll elasticities from other studies are also available, but these elasticities typically measure the change in demand resulting from a toll increase. As a toll does not currently exist on the corridor, this type of elasticity may not be as pertinent. Furthermore, toll elasticities are typically available for urban facilities where public transit is usually available and other costs such as parking charges can be a significant component of the overall out-of-pocket cost.

Exhibit 5.20 provides a summary from various studies of vehicle demand elasticities for changes in fuel prices and out-of-pocket costs. These studies show that short run (one to two years) elasticities are typically half that of long run elasticities (10 to 15 years) and non-work or recreation travel is more sensitive to price increases. The average short run and long run elasticities from these studies are approximately -0.2 and -0.4, respectively.

Using a range of elasticities of –0.2 to –0.4 (for the change in vehicle trips versus the change in out-of-pocket costs) it is possible to develop a rough estimate of trip diversion for specific toll levels. Assuming the average auto trip cost between Vancouver and Squamish is $8, the application of an $8 toll (a 100 percent increase in the out-of-pocket cost) could effectively reduce vehicle demand for trips between these two locations by 20 percent in the short term increasing to 40 percent in the long term. For trips travelling between Vancouver and Whistler, the out-of-pocket costs are approximately double (assuming no parking charges) and hence, these trips could decline by 10 to 20 percent.

This approach simply provides an order of magnitude estimate of the impact of tolls on travel demand. As this corridor has unique demand characteristics and no history with tolling, detailed data collection and analysis would be required to prepare investment grade toll diversion and revenue estimates.

Exhibit 5.20 – Vehicle Demand Elasticity Estimates

Author	Elasticity Type	Short Run	Long Run	Undefined	Trip Purpose
Johansson & Schipper (1997)	Fuel Price		-0.3		general
Luk & Hepburn (1993)	Fuel Price	-0.1			general
Moore & Thorsnes (1994)	Fuel Price	-0.25	-0.5		work trips
Moore & Thorsnes (1994)	Fuel Price	-0.5	-0.75		non-work trips
Oum et al. (1992)	Out-of-pocket vehicle expenses	-0.23	-0.28		general
Oum, Van Ooststroom and Yoon (1996)	Out-of-pocket vehicle expenses	-0.02	-0.28		general
De Borger et al. (1997)	Out-of-pocket vehicle expenses			-0.384	general
Industry Commission (1993)	Variable car costs	-.09 to -0.24	-.22 to -0.31		general
Industry Commission (1993)	Fuel Price	-.04 to -0.20	-0.3		general

6. Conclusions

The main objective of this study is to estimate the long-term demand for rail and other multi-modal services on the Sea-to-Sky corridor up to 2025, and to identify feasible opportunities that could be operational by 2010.

Four corridor options were selected for demand estimation and evaluation. These options provided the range of possible multi-modal improvements for the Sea-to-Sky corridor and were defined as follows:

- ☐ **Option 1 – Highway Emphasis** featuring the four laning of Highway 99 North between Horseshoe Bay and Squamish and highway safety improvements.
- ☐ **Option 2 – Medium Rail Investment** featuring increased passenger rail rolling stock and improved frequencies between Lonsdale Quay and Whistler.
- ☐ **Option 3 – Maximum Rail Investment** would result in a 25 minute reduction in travel time between Lonsdale Quay and Whistler with identical service frequencies as option 2.
- ☐ **Option 4 – Passenger-Only Ferry/Bus** included a new passenger-only ferry service between Central Waterfront and Squamish, and bus connection to Whistler.

Current inter-city corridor demand was estimated using a combination of existing information and original surveys conducted for this study. Two marketing research studies were completed to assess current demand levels of residents and non-residents and the consumer interest in the proposed options. A survey of bus companies operating in the corridor was also conducted to estimate inter-city bus movements and ridership.

Based on these various data sources current inter-city corridor demand was estimated at approximately 11 million trips per year. Residents of the corridor and Lower Mainland account for approximately 83 percent of the total travel demand. The remaining 17 percent of travel is made by non-residents (e.g. Rest of B.C., Canada and International). Auto demand (drivers and passengers) accounts for 93 percent of total inter-city demand. Bus and rail passengers account for six percent and less than one percent of travel demand, respectively.

A 24-hour inter-city EMME/2 demand forecasting model was developed to estimate 2010 and 2025 demand for the four corridor options. Under baseline conditions, total inter-city corridor travel is forecast to increase from the current level of 11 million to 13 million in 2010 (20 percent increase) and 17 million by 2025 (55 percent increase). Average Annual Daily Traffic (AADT) volumes between Horseshoe Bay and Squamish are forecast to increase from approximately 10,800 to 16,300 by 2025 (a 50 percent increase). Between Squamish and Whistler, AADT is expected to increase from approximately 7,700 to 11,200 by 2025 (a 45 percent increase).

Bus travel is estimated to increase from the current annual level of 0.7 million to 1.25 million in 2025 (an 80 percent increase). This can be attributed to the higher growth rate associated with non-resident travel. Rail is also forecast to increase at similar rates, but will still only capture less than one percent of total corridor demand.

Travel forecasts for the four options were developed using the EMME/2 demand forecasting model. Capital and operating/maintenance costs were provided for each option. A high level evaluation was undertaken to compare the costs of each option with the resulting travel time benefits. Additionally, information on the cost per trip was developed for each option by travel mode. On the basis of travel time benefits alone, the options do not appear to justify their costs. However, accident costs savings have not been estimated for this study and could have a significant impact on the benefits associated with each option.

In summary, the key conclusions drawn from this study are:

- The multi-modal options tested do not appear to divert significant demand from Highway 99 North. Note that this analysis assumed status quo TDM measures and no highway tolling within the study area.
- Market research results indicate that an enhanced bus service concept may offer potential to divert some automobile traffic from Highway 99 North.
- The passenger-only ferry service may offer potential as an independent service.
- The medium and maximum rail options tested for this study are not viable alternatives for servicing long-term demand in the Sea-to-Sky corridor.

Additional planning and detailed analysis would be required if further consideration is given to any of these options.

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Appendix A

Demand Phase Research Report

Sea-to-Sky Corridor Marketing Research:

Corridor Travel Habits and Transportation Options Concept Testing

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Foreword

Background and Research Objectives

This report presents the findings of the demand phase marketing research conducted among the general public. Two marketing research studies were designed to provide primary data on the current habits and characteristics of Sea-to-Sky Corridor users and to evaluate users' opinions of four proposed future transportation options:

- Expanded highway—with four lanes from Horseshoe Bay to Squamish and road safety/spot improvements between Squamish and Whistler.
- Medium rail—improved passenger cars, increased frequency (3 trains per day in each direction), $25 one-way to Squamish/$50 to Whistler, no change to travel time (3 hours to Whistler), station re-location close to SeaBus in North Vancouver.
- Maximum rail—same as medium rail but with improvements to the track, reducing travel time by about 20 minutes and increasing cost to $35 one-way to Squamish/$70 to Whistler.
- Passenger-only ferry—operating between Downtown Vancouver and Squamish with bus connection to Whistler, 4 ferries per day in each direction, $25 one-way to Squamish/$35 to Whistler for ferry-bus service, 1 hour to Squamish and 2 ¾ hours to Whistler.

The Sea-to-Sky Corridor is defined in this research as " the region from Lion's Bay, just north of Horseshoe Bay, up to Whistler, BC." A map of the corridor region is appended.

Objectives of the consumer marketing research are:

- To determine the current incidence and level of usage of the Sea-to-Sky Corridor in the local market regions.
- To ascertain travel habits along the corridor, including trip characteristics such as origin, destination, trip purpose, party size, current modes of transportation, trip days and length, commuting behaviour.
- To profile users of the Sea-to-Sky Corridor.
- To assess consumer interest and market potential for proposed transportation options.

Methodology

Two surveys were completed to fulfil these objectives: a study of the residential market and a study of the non-residential market.

Residential Market:. A **random telephone study of the Sea-to-Sky Corridor's residential market** was completed September 18 to October 9, 2001 from McIntyre & Mustel's CATI (computer assisted telephone interviewing) facility in Vancouver. The "study area" for the random telephone survey of residents encompassed the following:

- the local BC market region—consisting of residents of the Greater Vancouver Regional District (GVRD) and residents of the Sea-to-Sky Corridor, which includes Whistler, Squamish and other communities/areas from Lion's Bay to Whistler.
- the nearby US market—consisting of Washington and Oregon states.

A random cross-section of area residents 16 years of age and over was screened on the basis of having traveled on the Sea-to-Sky Corridor in the past year. Rigorous, industry-standard sampling and random selection methods were used to select the household and the respondent within the household, as well callbacks to minimize non-response bias, equalizing the day of week of calls and weighting to adjust the sample to population statistics. A total of 1,854 cross-section interviews were completed, yielding 910 Sea-to-Sky Corridor users. A disproportionate sampling plan was devised to allow examination of the key regions; these were weighted back into correct proportion at the data analysis stage.

Non-residential Market: In addition, to capture the opinions of **non-residents**, an interviewer-administered **on-site study** was conducted in Whistler on October 6-9, 2001. Eligible respondents were visitors to Whistler, 16 years of age and over who do not reside in BC and included:

- Other Canadians (residents of all other provinces and territories)
- US residents (including Washington and Oregon and all other states)
- International visitors (residents of any other country)

211 interviews were conducted with eligible respondents. Note that the on-site survey included Washington and Oregon visitors to Whistler, (as did the phone survey) since so few Sea-to-Sky users were encountered in the random telephone study.

Full details of the methodologies of both studies are appended, as well as a copies of the questionnaires.

Results

The results are presented in the following *Detailed Findings* section with separate sections for the telephone study of local BC residents and the on-site study of non-residents.

Base sizes shown in graphs and tables reflect the actual (rather than weighted) number of interviews completed. The following notations have been used to indicate numerical differences in summary tables of this report (at the 95% confidence level).

Significantly higher ▲ Directionally higher Significantly lower ▼ Directionally lower

Significantly higher means that there is less than 5% probability of the results occurring by chance.

Detailed Findings
Telephone Survey of Residential Market

1.0 Introduction

Detailed findings from the demand phase telephone survey are presented in this section. These results reflect the habits, characteristics and opinions of study area residents who travel the Sea-to-Sky Corridor. Most of the findings presented throughout this report reveal proportions of corridor ***users*** themselves (i.e., the "consumers"), rather than proportions of ***trips*** per se.

The Sea-to-Sky Corridor, defined as " the region from Lion's Bay, just north of Horseshoe Bay, up to Whistler," forms the context for the telephone survey among study area residents. The telephone survey "study area" included:

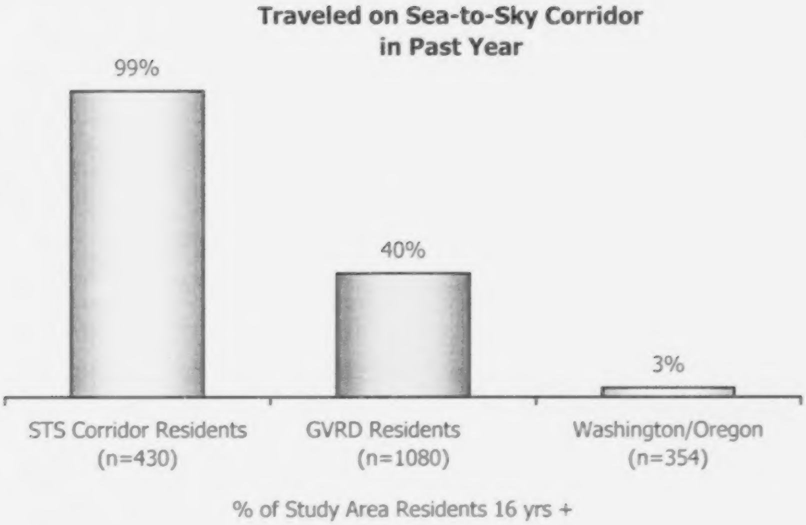
- the local BC market region—consisting of residents of the Greater Vancouver Regional District (GVRD) and residents of the Sea-to-Sky Corridor, which includes Whistler, Squamish and other communities/areas from Lion's Bay to Whistler,
- the nearby US market—consisting of Washington and Oregon states.

2.0 Use of the Sea-to-Sky Corridor

2.1 Incidence of Corridor Travel in Past Year

Use of the Sea-to-Sky (STS) Corridor varies greatly across the study region, according to geographic proximity. As would be expected, virtually all of those residing in and adjacent to the Sea-to-Sky Corridor (99%) have traveled along this corridor in the past year. Note that STS Corridor residents are defined as those whose *primary* residence is in the Corridor region.

Among GVRD residents, 40% have traveled along the STS Corridor in the past year. In Washington/Oregon combined, less than 3% of the population 16 years of age and over have traveled the STS Corridor in the past year, although over 20% have visited BC in this time period.



Examining the Greater Vancouver Regional District, North Shore residents are much more apt to be corridor users (nearly 60%), compared to their counterparts in the other areas of the GVRD (32-42%).

The incidence of visiting BC and of travelling the STS Corridor is greater among Washington residents than Oregonians. Almost 30% of Washington residents have visited BC, compared to about 7% of Oregon residents. In terms of STS Corridor travel, nearly 4% of Washington and 1% of Oregon residents are past year STS users.

Traveled on STS Corridor in the Past Year

GVRD Residents (n=1,080)	40%	
North Shore (n=213)	59%	▲
Vancouver/ Burnaby/ New Westminster (n=286)	42%	
Other GVRD North of River (n=264)	42%	
Other GVRD South of River (n=317)	32%	
Washington/ Oregon (n=354)	3%	
Washington State (n=223)	4%	
Oregon State (n=131)	1%	

Telephone Survey Q1b: Our study concerns travel along the Sea to Sky Corridor, that is the region from Lion's Bay, (just north of Vancouver) all the way up to Whistler. In the past year have you, yourself, traveled anywhere along the Sea to Sky Corridor by private vehicle, bus or train?

Compared to study area residents in total, the profile of local BC users of the Sea-to-Sky Corridor is skewed male (59%). In addition, corridor travel and age are correlated, as significantly fewer seniors 65 and older are found among corridor users than is seen among the population at large.

Basic Demographics of STS Users
Versus Study Area Residents

	Total Study Area Cross-section (Census)	**Local BC Study Area Cross-section** (Census)	**Local BC STS Users**** (n=900)
Population Estimates for 2001	*8,837,287*	*1,556,012*	*629,753*
	%	%	%
Area of Residence			
Corridor Resident	***<1***	***1***	***3***
Whistler	*<1*	*<1*	*1*
Squamish	*<1*	*1*	*2*
Other Corridor	*<1*	*<1*	*<1*
GVRD Resident	***17***	***99***	***97***
North Shore	*2*	*9*	*13*
Vancouver/Burnaby/New Westminster	*7*	*43*	*44*
Other North of Fraser River	*2*	*12*	*13*
South of Fraser River	*6*	*35*	*27*
Washington/Oregon Resident	***82***	-	-
Gender			
Male	*49*	*49*	*59* ▲
Female	*51*	*51*	*41*
Age			
16-24	*15*	*15*	*14*
25-34	*18*	*22*	*24*
35-44	*21*	*22*	*23*
45-54	*19*	*17*	*20*
55-64	*12*	*10*	*11*
65 or over	*16* ▲	*15* ▲	*8* ▼

*** User demographic estimates exclude Washington/Oregon due to small sample of that user base.*

2.2 Market Size and Study Area Target Population Estimates

The following chart provides 2001 population estimates for those 16 years of age and over in each geographic area of the study region and corresponding estimates of the Sea-to-Sky target market (corridor travelers in the past year). These census projections reflect an "aging" of the most recently available census distributions (i.e., adjusting age category counts by the number of years since the last census collection); these projections have also factored in the overall effects of immigration and mortality on the population totals.

Market Size & Population Estimates

	BC & US Study Region		
Area of Residence	**Total Cross-section 16 Years +** (2001 Projections*)	**Sea-to-Sky Travellers** (Market Size Est.*)	**Approx. Statistical Tolerance Limits****
Total BC Study Area	*1,556,012*	*629,800*	*±2.5%*
Corridor Resident	*18,734*	*18,600*	*± 0.9%*
Whistler	6,389	6,400	± <1%
Squamish	10,941	10,800	± 1.8%
Other Corridor	1,404	1,400	± <1%
GVRD Resident	*1,537,278*	*611,200*	*± 2.9%*
North Shore	139,295	82,400	± 6.6%
Vancouver/Burnaby/New Westminster	661,514	275,200	± 5.7%
Other North of Fraser River	192,161	80,900	± 5.9%
South of Fraser River	544,309	172,700	± 5.2%
Washington/Oregon	*7,281,267*	*194,300*	*± 1.7%*
Total Study Region	***8,837,287***	***824,100***	

* *Cross-section projections based on 1996 Canadian Census and 2000 US Census; Market size estimates based on Census projections applied to Telephone Survey data Q1b., rounded up to nearest 100.*

** *Based on telephone survey sample sizes in each area; tolerance limits for simple random samples at the 95% confidence level (estimates expected to fall within this range 19 times out of 20).*

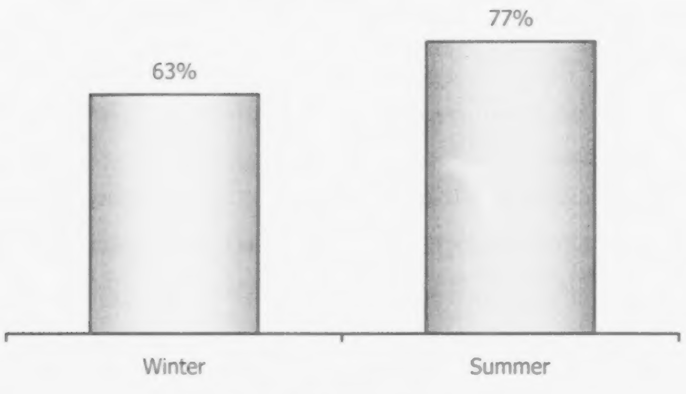
3.0 Corridor Travel Habits

After the initial screening to confirm the primary residence area and to determine past year usage of the corridor, the remaining survey questions were asked of qualifying respondents (corridor users who reside in the defined study area). Since the incidence of Sea-to-Sky Corridor use was found to be extremely low in Washington and Oregon, this user group was included in the Whistler On-site survey of non-resident visitors (see Section 8.0 of this report). As a result, the telephone survey findings reported from this point onward reflect the habits and opinions of ***local BC residents using the corridor*** in the past year. ("Local BC residents "is defined as residents of the GVRD and residents of the STS corridor from Lion's Bay up to and including Whistler.)

3.1 Seasonal Use

For the purpose of this study travel has been divided into two seasons: the "winter season" covering November through April and the "summer season" covering the balance of the year. Respondents were asked to report their travel habits for the most recent winter and most recent summer seasons. Due to timing of the survey (in September), habits were collected for the May to August period and trip frequencies pro-rated to the full season. Local BC residents who use the Sea-to-Sky corridor are more likely to report traveling on this route in summer (77%) than in winter (63%).

Season of Travel

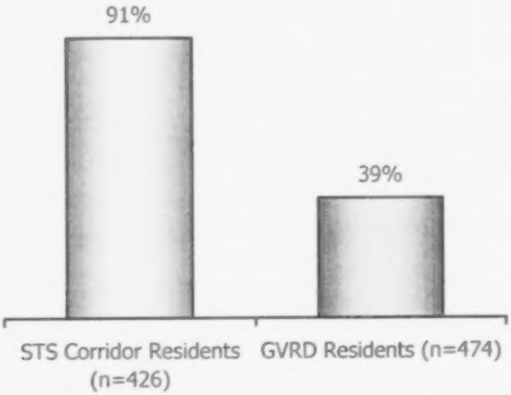


% of Local BC Corridor Users (n=900)

Telephone Survey Q2/Q4: First I'd like you to think about the most recent winter/summer season, that is, from November 2000 to April 2001/ Next I'd like you to think about the current summer season, that is from May thorough August of 2001. Did you travel on the Sea to Sky Corridor at least once during this time period?

As well, a considerable proportion of STS users travels along the corridor in both summer and winter. Among STS corridor residents, over 9-in-10 are dual season users, while among GVRD residents about 4-in-10 travel in both seasons. Within the GVRD North Shore residents are most apt to be dual season users (56%).

Dual Season Users



Telephone Survey Q2/Q4: First I'd like you to think about the most recent winter/summer season, that is, from November 2000 to April 2001/ Next I'd like you to think about the current summer season, that is from May thorough August of 2001. Did you travel on the Sea to Sky Corridor at least once during this time period?

The only significant demographic difference found in seasonal use is that the proportion of seniors 65 years of age and over using the corridor in summer is double that found in the winter season. In other respects, there is little differentiation between winter and summer travelers, indicating that the corridor is drawing all demographic groups throughout the year.

Summer versus Winter Season User

	Local BC Sea-to-Sky Users		
	Total STS Users (900) %	Winter Travelers (702) %	Summer Travelers (774) %
Age			
16-24	14	12	13
25-34	24	27	25
35-44	23	24	23
45-54	20	22	20
55-64	11	10	10
65+	8	4	9 ▲

3.2 Frequency of Corridor Travel

Respondents were asked the frequency with which they traveled along the Sea-to-Sky corridor in both winter and summer. Sea-to-Sky Corridor residents tend to make about 86-87 one-way trips in each season. GVRD residents who travel the corridor report, on average, just over 4 one-way trips in winter and about 5 one-way trips in summer. (Note that the summer season trips have been pro-rated to the 6-month May to October period[1]).

Frequency of Travel

		STS Corridor Users		
	Total BC Study Area Cross-section (n=1,510) #	**Total STS Users** (n=900) #	**Corridor Residents** (n=426) #	**GVRD Residents** (n=474) #
Average # One-way Trips				
Winter	2.8	6.9	86.7	4.5
Summer	3.0	7.6	86.1	5.2
Average Annual per resident	***5.8***			
Average Annual per STS user		***14.5***	***172.8***	***9.7***
Median # One-way Trips				
Winter	0	2	48	2
Summer	0	3	47	3
Estimated Total One-way Trips*				
Winter	4.2 million	4.2 million	1.6 million	2.6 million
Summer	4.7 million	4.7 million	1.6 million	3.1 million
Annual Total	***8.9 million***	***8.9 million***	***3.2 million***	***5.7 million***

** Derived from Telephone Survey only and projected to 2001 population 16 years and over*

Q2/Q4: First/ I'd like you to think about the most recent winter/summer season, that is, from November 2000 to April 2001/ Next I'd like you to think about the current summer season, that is from May thorough August of 2001. Did you travel on the Sea to Sky Corridor at least once during this time period?

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[1] *The recent summer season habits reported in this telephone survey cover the period from May to August 2001. Trip frequency estimates have been adjusted to reflect the full May to October season; a factor of 1.4 has been applied to expand the number of summer trips (Source: TSi Consultants).*

4.0 Profile of Corridor Travelers among Residents

4.1 Sea-to-Sky User Profiles

Local BC residents who use the corridor fall into two main geographic markets with quite distinct usage habits: i) those residing within the corridor and ii) those those residing in the GVRD. To establish a context for understanding the residential market, the characteristics of these two groups are profiled here.

The size of these two markets is vastly different. In terms of population, GVRD residents represent 97% of corridor users, while STS residents merely 3%. Following are some observations of these two user profiles.

- GVRD corridor users are skewed male (59%), directionally more so than among corridor residents (53%).
- Slightly more corridor residents are employed, compared to GVRD users of the corridor (60% versus 53%).
- One-third of corridor residents report commuting to work or school by using the corridor, while among GVRD travelers on the corridor, few are commuting (less than 1% of GVRD users).
- Corridor residents are generally less affluent than GVRD residents who travel the corridor.

Sea-to-Sky User Profiles

	Local BC Sea-to-Sky Users		
	Total STS Users (900) %	**Corridor Residents** (426) %	**GVRD Residents** (474) %
Gender			
Male	59 ▲	53	59 ▲
Female	41	47	41
Age			
16-24	14	17	14
25-34	24	28	24
35-44	23	24	23
45-54	20	15	21
55-64	11	8	11
65+	8	6	8
Refused	1	1	1
Employment Status			
Employed full-time	54	60 ▲	53
Employed part-time	14	13	14
Student	10	6	10
Other (homemaker, retired, not working)	20	18	21
Refused	2	3	2
Corridor Commuter to Work/School (outside of home community)			
Yes	2	33 ▲	<1
No	98	67	99
2nd Property in Corridor (if GVRD resident) **or in GVRD** (if Corridor resident)			
Yes	2	4	2
No	98	96	98
Household Size			
One	15	13	15
Two	31	29	32
Three or more	54	57	53
Average #	*3*	*3*	*3*
Household Income			
Under $50,000	29	32	29
$50,000-74,999	19	24	18
$75,000 or more	34	25 ▼	34
Refused	19	18	19

4.2 Corridor Commuting

Those who reported that they regularly commute to work or to school by traveling along the corridor (both corridor and GVRD residents) were asked the municipality they commute to and the frequency of commuting. The table following indicates proportion of *commuters (not trips)* traveling to each work/school destination. Due to the small sample, an origin-destination matrix is not presented here. The Demand Model Forecast provides origin-destination *trip* estimates (see Section 4 of Main Report).

Most corridor commuters are traveling to work/school destinations ***within*** the corridor (about 6-in-10), while about one-third are commuting to the GVRD. Just under half (45%) commute at least 5 days a week. The average is just under 4 days per week.

Also of interest, two-thirds of corridor commuters report working full-time and about one-quarter part-time. Students make up about 4%, while about 3% are retired/not working, apparently travelling for educational or volunteer work purposes.

Commuting Habits

	STS Corridor Commuters (n=134) %
Commuting Destination	
Any Sea-to-Sky Corridor community/area	***58***
Whistler	32
Squamish	5
Other Sea-to-Sky Corridor community/area	21
GVRD	***33***
North Shore	11
Vancouver/ Burnaby/ New Westminster	19
Other GVRD North of River	1
Other GVRD South of River	2
North of Whistler *(Pemberton)*	***9***
Frequency of Commuting	
1-2 days a week	31
3-4 days a week	11
5 days a week	39
6-7 days a week	6
Varies/don't know	14
Average # days per week *(excluding "varies/don't know")*	***3.8***

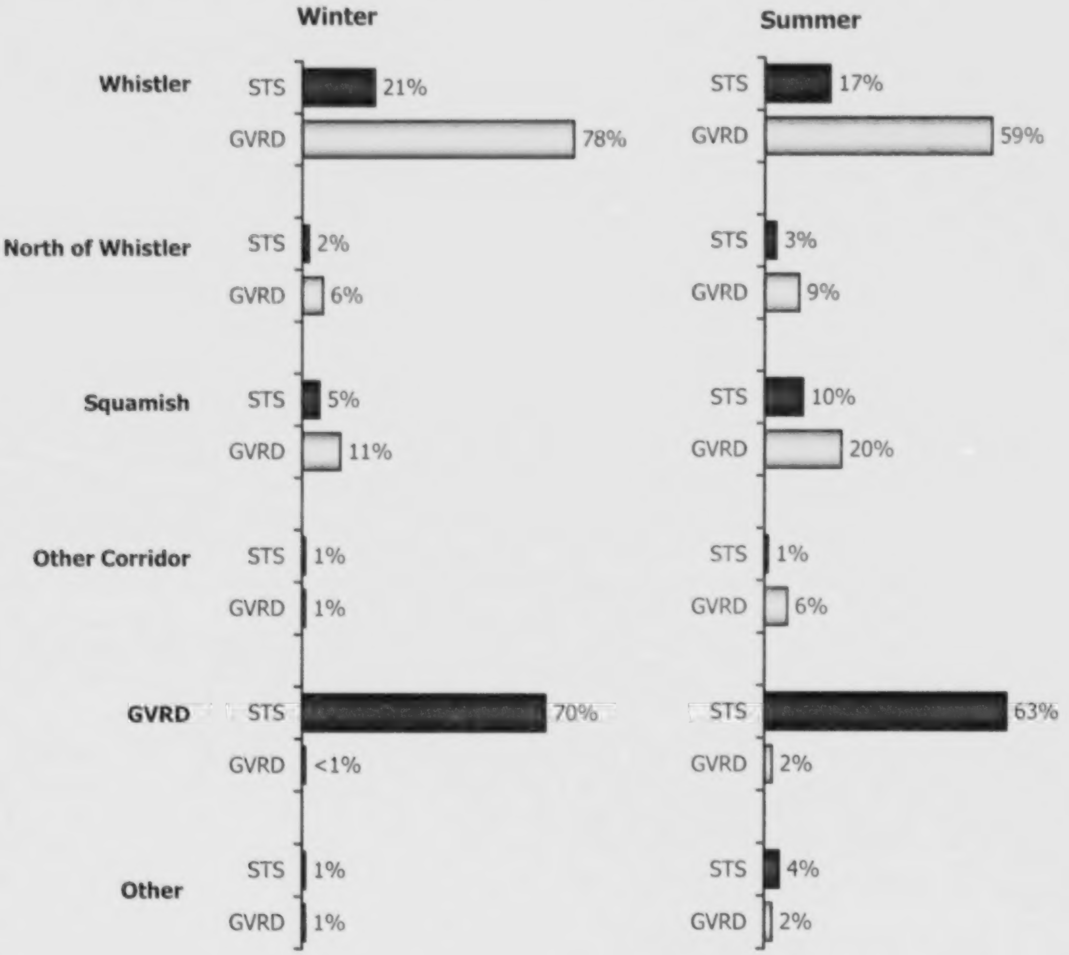
Q1-ci: Do you commute to work or school in a different municipality by traveling along the Sea to Sky corridor? Q1-ci: In which municipality? Q1-ci: How many days a week?

5.0 Trip Characteristics among Residents

5.1 Destination

Winter and summer travel patterns are generally similar. Most STS Corridor residents are bound for the GVRD, while a majority of GVRD residents using the Corridor are destined for Whistler in both seasons. Travel to Squamish by GVRD corridor users increases during the summer season (20% in summer versus 11% in winter).

Furthest Destination



Base: Winter Corridor Travellers
STS Residents (n=399)
GVRD Residents (n=303)

Base: Summer Corridor Travellers
STS Residents (n=413)
GVRD Residents (n=361)

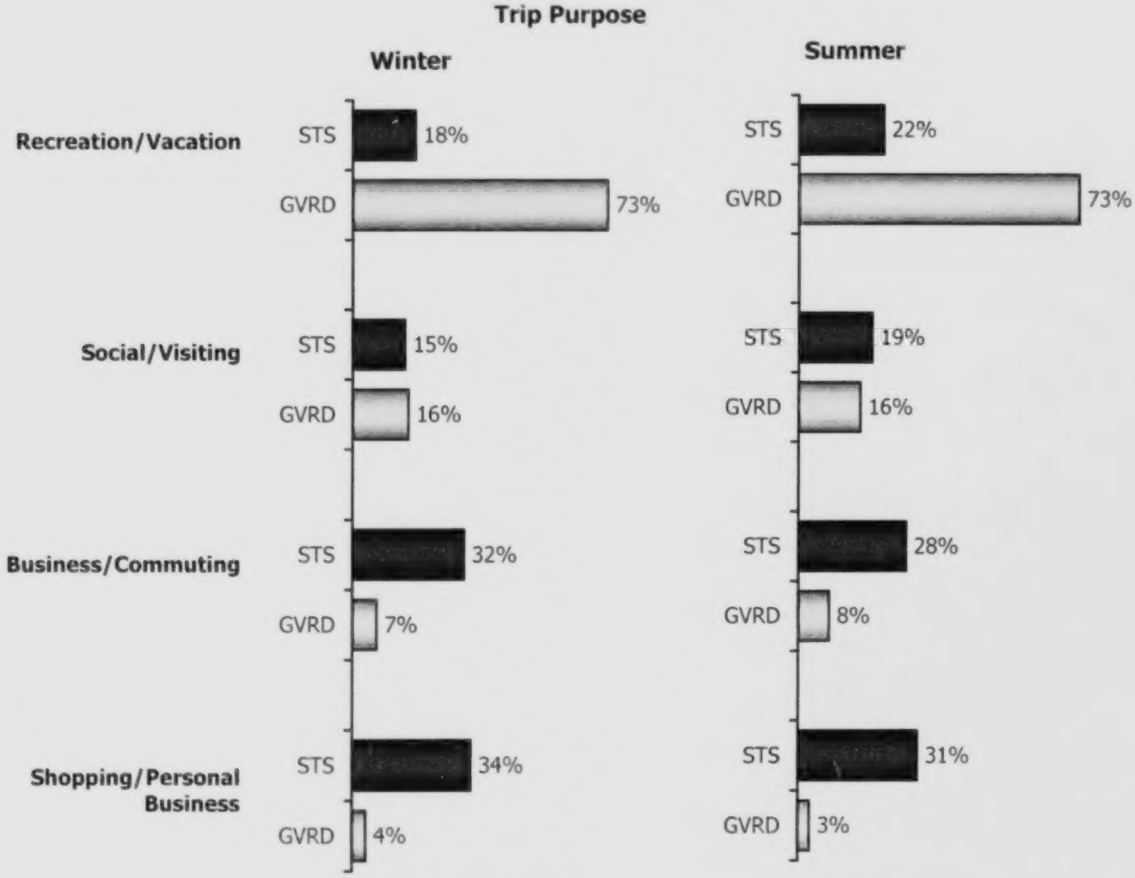
Telephone Survey: Q3b/5b: What was your final destination ?

In the winter season Whistler is a more likely destination for the younger under-35-year-old and the middle-aged segments (81% and 74%, respectively) than for those 55 years of age and over (67%). But, during the summer Whistler draws all age groups to a similar degree (55-60% of corridor users across these age segments).

5.2 Purpose of Trip

Among GVRD residents, most (73%) are travelling for recreation, including vacationing, regardless of season.

STS Corridor residents, however, travel for a host of reasons. Commuting/ business trips rival shopping/personal business trips with each reported by about 30% of Corridor residents. Winter and summer patterns are similar.



Base: Winter Corridor Travellers
STS Residents (n=399)
GVRD Residents (n=303)

Base: Summer Corridor Travellers
STS Residents (n=413)
GVRD Residents (n=361)

Telephone Survey Q3/5c: : What was the main purpose of your most recent winter/summer trip o the Sea-to-Sky Corridor?

5.3 Party Size

While the vast majority reports a party size of four or fewer persons (87%), the remainder tells us that their trip party is larger. In the case of private vehicle trips, some are traveling in vans with larger occupancy capacity and others in a group of vehicles. A few bus users appear to report that their trip party is the whole bus load (which may indicate a tour group, e.g., school group, other group travel). For this reason, extreme values have been removed from the mean calculations only.

As might be expected, people are more likely to travel alone for commuting and work/business purposes. In winter 56% of business-related/commuter travel is made alone and 42% of this segment report traveling alone in summer.

STS corridor residents, on average, travel in smaller groups, not surprising, given the variety of reasons for their trips. The trip party size averages between 2 to 3 persons among corridor residents in both winter and summer.

GVRD residents, who travel the corridor mainly for recreational purposes, have larger trip parties. The average party size is about 3 to 4 persons in both seasons.

Size of Trip Party

	BC Study Area (season users)		
	Total STS Users	**STS Corridor Residents**	**GVRD Residents**
Winter	(n=702)	(n=399)	(n=303)
	%	%	%
One	10	33	9
Two	39	31	39
3	13	14	13
4	24	13	25
5-9	9	7	9
10-19	2	<1	2
20+	3	-	3
Don't Know	<1	1	-
Average party size*	***3.1***	***2.3***	***3.1***
Median party size	***3***	***2***	***3***
Summer	(n=774)	(n=413)	(n=361)
	%	%	%
One	8	36	7
Two	37	29	37
3	19	13	19
4	23	14	24
5-9	8	8	8
10-19	3	-	3
20+	2	<1	2
Don't Know	<1	1	<1
Average party size*	***3.2***	***2.3***	***3.3***
Median party size	***3***	***2***	***3***

** Extreme values (20 or more) removed from calculation of average.*
Telephone survey Q3d, Q5d: How many people, including yourself, were in your trip party?

5.4 Current Mode of Transportation

Private vehicle is overwhelmingly the current mode of choice with corridor users in both seasons. In total, about 94-95% report taking a private vehicle on their most recent winter or summer trip along the Corridor. Extremely high levels of use are seen across all demographic groups and across trip characteristics (trip purposes, trip lengths and party sizes).

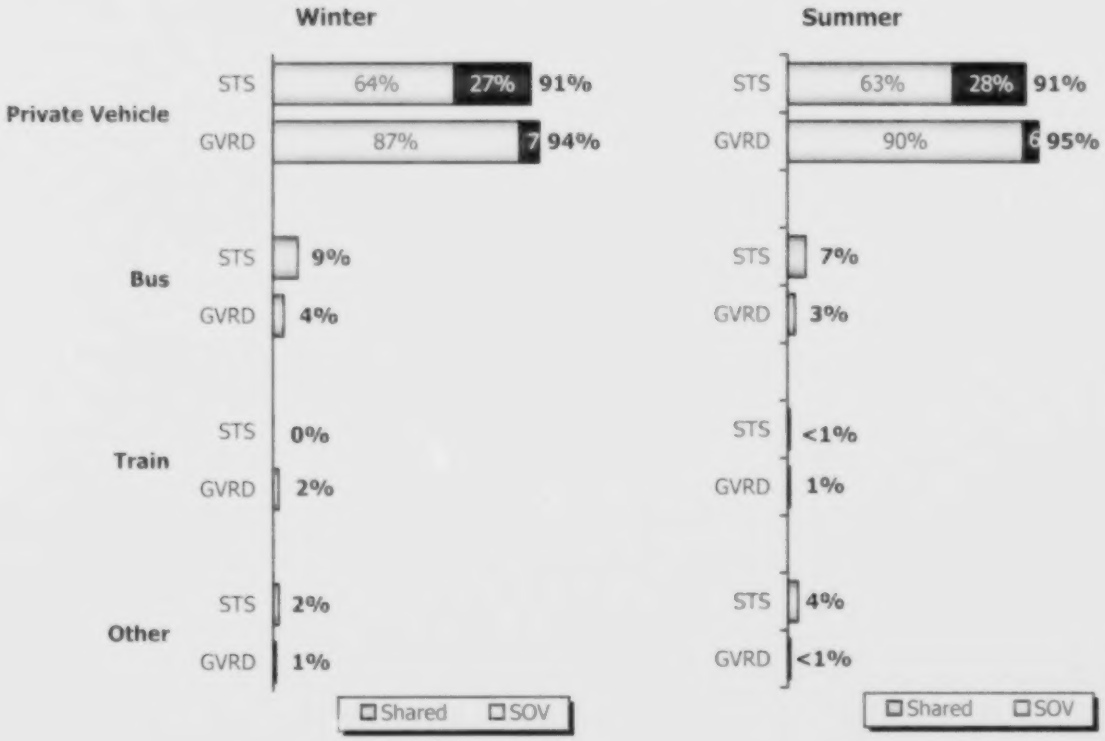
Most private vehicle users are carpooling/vanpooling (in a group of two or more)—about 65% of corridor residents and nearly 90% of GVRD residents who travel the corridor. Note that single occupancy vehicle (SOV) use is notably higher among STS Corridor residents (27-28% versus 6-7% among GVRD users of the corridor), not surprising, given their broader variety of travel purposes.

Bus travel is the most common *alternative* mode, reported by about 7-9% of Corridor residents and about 3-4% of GVRD residents who use the corridor. As well, the incidence of bus use is higher among the following sub-groups:

- Those traveling alone (19% in winter, 8% in summer)
- Students (16-18% in both seasons)
- Less affluent households (9-13% of under $50,000 household income)
- STS residents (7-9% versus 3-4% GVRD)
- Women (5-7% versus 2% among men)

Current use of the **train** among the local BC market is minimal (1-2%). Other modes are used by less than 1% of corridor travelers.

Mode of Transportation



Base: Winter Corridor Travellers
STS Residents (n=399)b
GVRD Residents (n=303)

Base: Summer Corridor Travellers
STS Residents (n=413)
GVRD Residents (n=361)

Telephone Survey Q3e/5e: And what modes of transportation did you use on your most recent winter trip:

5.5 Trip Length

GVRD residents who travel the Corridor are divided in terms of trip length—about half making day trips and about half staying at their destination for one or more nights. On the other hand, STS corridor residents are most likely to return on the same day.

Length of Stay

		BC Study Area	
	Total STS Users	**STS Corridor Residents**	**GVRD Residents**
Winter			
	(n=702) %	(n=399) %	(n=303) %
Day trip	49	77 ▲	48
Overnight trip	51	21	52
Average no. of nights *(among overnight travelers)*	***2.2***	***2.4***	***2.2***
Summer			
	(n=774) %	(n=413) %	(n=361) %
Day trip	53	71 ▲	52
Overnight trip	47	28	48
Average no. of nights *(among overnight travelers)*	***2.6***	***3.7***	***2.5***

Telephone survey Q3f-ii, Q5f-ii: Was this most recent winter trip a day trip? Was this most recent trip a day trip or overnight?

5.6 Weekday Only versus Weekend Travel

GVRD residents are more likely to include a weekend in their trip, while Sea-to-Sky residents are skewed to weekday only travel along the corridor.

Weekday Only vs Weekend

	Total STS Users	BC Study Area STS Corridor Residents	GVRD Residents
Winter			
	(n=702) %	(n=399) %	(n=303) %
Weekend included	65	39	66 ▲
Weekday only	33	55 ▲	32
Don't recall/ refused	2	6	1
Summer			
	(n=774) %	(n=413) %	(n=361) %
Weekend included	65	37	66 ▲
Weekday only	32	60 ▲	32
Don't recall/ refused	1	3	1

Q3f-iii, Q5f-iii: Did it cover the weekend?

6.0 Factors Influencing Mode-Choice

6.1 Most Influential Factors in Mode-Choice

To assist in understanding how people select the mode of transportation to be used for their Sea-to-Sky travel, respondents were asked to rank five key factors that may have influenced their decision. The factors tested were: i) *Arriving and departing whenever you want*, ii) *Comfort of the ride*, iii) *Cost of transportation*, iv) *Total travel time and* v) *Having a unique travel experience*. (Note that approximately half of respondents answered in the context of their most recent winter trip and the other half their summer trip; there was no difference in the pattern of responses for the two seasons).

Clearly, flexibility in arrival and departure time is by far the most influential dimension in mode-choice. Over 6-in-10 corridor travelers who reside in the local BC market select "*arriving and departing whenever you want*" as the factor having the greatest influence on their mode decision. When combining first and second most influential factors, this attribute is chosen by over 80%. The private vehicle, of course, is unparalleled in terms of flexibility, making it very difficult for alternative modes to compete on this dimension.

Results are similar for both corridor residents and GVRD residents. As well, there are no apparent differences in ranking of selection criteria for winter and summer trips.

The remaining factors measured appear to rank at similar levels, but when using an ***index*** that compares the gap between being selected as the most and the least influential, some distinctions become more apparent. "*Having a unique travel experience*" is quite clearly least important to local BC residents, particularly to corridor residents. *Cost* ranks somewhat below *comfort* and *travel time* among GVRD residents.

Influence of Factors on Mode Choice

	BC Study Area	
	STS Corridor Residents (n=426)	**GVRD Residents** (n=474)
Average Score (1=greatest, 5=least influential)		
Arriving and departing whenever you want	1.5	1.6
Comfort of the ride	3.0	3.0
Total travel time	2.8	3.1
Cost of transportation	2.9	3.3
Having unique travel experience	4.5	3.7
Greatest Influence	%	%
Arriving and departing whenever you want	▲ 60	▲ 61
Comfort of the ride	8	9
Cost of transportation	15	11
Total travel time	7	5
Having unique travel experience	1	8
Greatest/Second Greatest (combined)	%	%
Arriving and departing whenever you want	81	83
Comfort of the ride	28	31
Cost of transportation	31	27
Total travel time	33	27
Having unique travel experience	4	18
INDEX = % most - % least	%	%
Arriving and departing whenever you want	▲ +47	▲ +59
Comfort of the ride	-16	0
Total travel time	-15	-19
Cost of transportation	-14	▼ -29
Having unique travel experience	▼ -77	▼ -44

Telephone survey Q6a, Q6d: Next I'd like you to think specifically about your most recent trip this past [winter/summer] season . I'm going to read a list of reasons that may have influenced your decision to use [INSERT MOST RECENT MODE] instead of [INSERT MODES NOT SELECTED] on that trip. Here is the list: READ ENTIRE LIST. Which one of these items had the greatest influence, second greatest, etc.?

Private vehicle users are consistent in regarding the flexibility issue— *"arriving and departing whenever you want"*—as the most important (chosen by 64% of winter and 64% of summer STS users). Although the base of bus users is quite small in this study, the findings indicate that *"arriving and departing whenever you want"* is not the most important factor to most of them. However, results are inconclusive on which of these dimensions is most important to bus users.

Most Influential Factors by
Mode Used on Most Recent Trip

	Mode Used in Winter	
	Private Vehicle (n=658)	**Bus** (n=37)
Greatest Influence (first choice)	%	%
Arriving and departing whenever you want	64 ▲	21
Cost of transportation	11	19
Comfort of the ride	9	14
Total travel time	6	24
Having unique travel experience	8	-

	Mode Used in Summer	
	Private Vehicle (n=724)	**Bus** (n=35)
Greatest Influence (first choice)	%	%
Arriving and departing whenever you want	64	1
Cost of transportation	10	45
Comfort of the ride	9	32
Total travel time	5	-
Having unique travel experience	8	7

Telephone survey Q6a-d:

6.2 Other Factors of Significant Influence in Mode-Choice

Respondents were asked if anything else had a significant influence on their decision to choose the mode selected for this trip. Over half (55%) name no other aspects of influence. However, among those who offer other details, many of the conveniences and comforts of a private vehicle are raised. Specific mentions include (in order of magnitude):

- Ability to stop anywhere they want to.
- Inconvenience of public transportation—location of stops/stations, inconvenient schedules, poor system/inconvenient alternatives.
- Need space for equipment/luggage.
- Fact that they have a car—accessible and available, so might as well use it.
- Lack of awareness or familiarity with the public transportation systems.
- Ability to move around at the destination.
- Enjoyment of driving, the feeling of independence.
- Need to accommodate others (in a group, traveling with kids, with pets).
- Comfort/privacy of a car (can smoke, listen to music, no crowds/strangers).

7.0 Sea-to-Sky Transportation Options: Concept Testing

Four transportation options were concept-tested with Sea-to-Sky Corridor users with the order of options rotated from interview to interview. The concept descriptions were, as follows:

i) Expanded Highway: The **Sea-to-Sky highway would be expanded** to 4 lanes between Horseshoe Bay and Squamish,(which is about half-way between Vancouver and Whistler). The portion of highway from Squamish to Whistler would remain 2 lanes, but there would be road safety and spot improvements along the route.

(OPTION 1). One/another transportation choice on the expanded highway would be private vehicle: Highway travel time by private vehicle from Downtown Vancouver would average about one hour to Squamish and about one and three-quarter hours to Whistler. Cost of gas and vehicle maintenance averages about $8 one-way from Vancouver to Squamish and $16 one-way from Vancouver to Whistler.

(OPTION 2). One/another transportation choice on the expanded highway would be highway coach: A highway coach bus service would run between Downtown Vancouver and Whistler with stops in Squamish and along the route. Buses would be available at least 7 times daily in each direction. The adult fare would be approximately $8 one-way from Downtown Vancouver to Squamish and approximately $20 one-way from Downtown Vancouver to Whistler. Total travel time by highway coach, including wait and boarding, from Downtown Vancouver would be about one and three-quarter hours to Squamish and three hours to Whistler.

ii) **Medium Rail:** BC Rail train service with comfortable up-to-date passenger cars would run between North Vancouver, Squamish and Whistler. The frequency of trains would increase to 3 trains per day in each direction. The adult fare from North Vancouver would be $25 one-way to Squamish and $50 one-way to Whistler. Total travel time from the North Vancouver train station would be about 2 hours to Squamish and about 3 hours to Whistler, including wait and boarding time. To get to the North Vancouver train station from Downtown Vancouver would take approximately 20 minutes by SeaBus or 30 minutes by private vehicle. Note that the train station would be relocated to be close to SeaBus, regional bus connections and a parking facility.

iii) **Maximum Rail:** BC Rail train service with comfortable up-to-date passenger cars plus improvements to the track, would run between North Vancouver, Squamish and Whistler. ...The frequency of trains would increase to 3 trains per day in each direction. The adult fare from North Vancouver would be $35 one-way to Squamish and $70 one-way to Whistler. Total travel time from the North Vancouver train station would be about one and three-quarter hours to

Squamish, and about two and three-quarter hours to Whistler, including wait and boarding time. ... To get to the North Vancouver train station from Downtown Vancouver would take approximately 20 minutes by SeaBus or 30 minutes by private vehicle. Note that the train station would be re-located to be close to SeaBus, regional bus connections and a parking facility.

iv) Passenger-only Ferry: A passenger-only ferry service would operate between Downtown Vancouver and Squamish. In Squamish there would be bus connections to Whistler. The passenger-only ferry service would run 4 times per day in each direction. Total travel time from Downtown Vancouver to Squamish would be about one hour, including wait and boarding time. To take the passenger-only ferry plus connecting bus to Whistler would take an average of two and three-quarter hours, including wait, transfer and travel times. The cost of the passenger-only ferry would be $25 one-way to Squamish and $35 one-way for ferry-bus service to Whistler.

All respondents were questioned about their general likelihood of using the proposed options. Then, those who expressed interest in the option were asked the frequency with which they might have taken this mode if it had been available in the most recent winter and/or summer season. Anticipated usage was only asked of those who currently use the Corridor in each season (e.g., winter only asked of current winter users and summer only asked of current summer users).

7.1 Interest in Using Proposed Options

Private vehicle on expanded highway (4 lanes to Squamish and spot improvement to the Whistler portion) by far, receives the highest level of interest and expected usage among the options tested. That the private vehicle continues to reign as the most popular mode choice is not surprising, given the current, broad use of and familiarity with this mode.

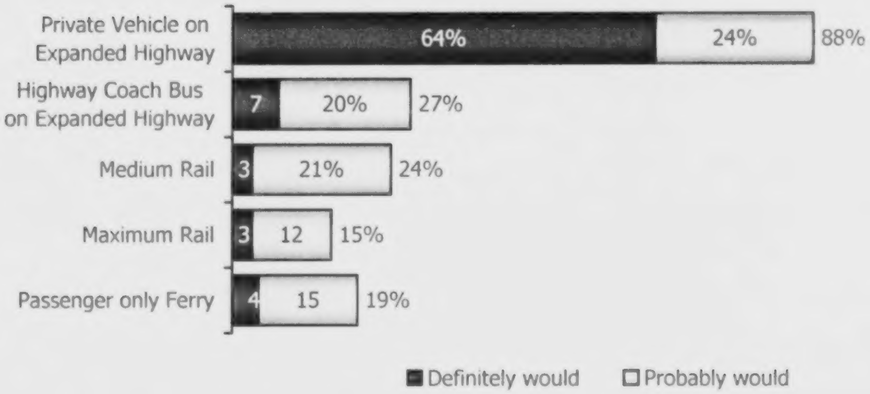
Of BC resident Sea-to-Sky travelers, nearly 9-in-10 (88%) claim that they "definitely or probably" would use private vehicle on an expanded highway for their trips along the Corridor with 64% in total saying "definitely." Another 4% say they "might or might not" travel by private vehicle, although most of them made their most recent trip this way. Currently, about 94-95% of local British Columbians traveling on the Corridor took private vehicles on their most recent winter/summer trip.

Among STS corridor residents, the commitment to private vehicle is especially strong (94% "definitely/probably" with 81% saying "definitely").

Other transportation choices

Each of the alternative mode choices attracts about 20-25% local BC users. However, only 3-4 % says they "definitely would use" each of these options. Strong interest in a highway coach bus service is higher (7% "definitely use").

Interest in Proposed Transportation Options Among Local BC Corridor Travellers



Base: n=900, with split sample for Rail concepts

Q7/8/9/10a: How likely would you be to use ____________? Would you say definitely, probably, might or might not, probably not or definitely not?

Demographic Differences

The following groups are more inclined to show interest in specific options ("definitely/ probably" combined proportions are noted, unless stated otherwise):

Private vehicle:

- STS Corridor residents (94% vs 88% for GVRD)
- Males (91% vs 83% of females)
- The affluent (73% *definitely* vs 52% for those under $50K household income)

Highway coach service:

- STS Corridor residents (34% vs 27% for GVRD)
- Students (58%), the under 35 year old group (39%) and less affluent (32% vs 27% overall interest in the highway coach)

Medium rail:

- GVRD residents who use the Corridor (24% vs 13% of STS residents)
- Males (28% vs 19% of females)
- Part-time and not employed (31-37% vs 20% of those working full-time)

Maximum rail:

- GVRD residents who use the Corridor (16% vs 9% of STS residents)
- More affluent (14% of $50K + household incomes vs 6% of under $50K)

Passenger-only ferry:

- Females (28% vs 12% of males)
- Less affluent (27% of under $50K household incomes vs 15% of $50K+)

7.2 Market Potential for Proposed Options

The following discussion about market volumes offers further indications about the market potential of these proposed transportation scenarios, as derived from this market research among local BC residents. For detailed trip generation estimates for both residents and non-residents, based on a broad array of data inputs, see the Section 4 of the Main Report.

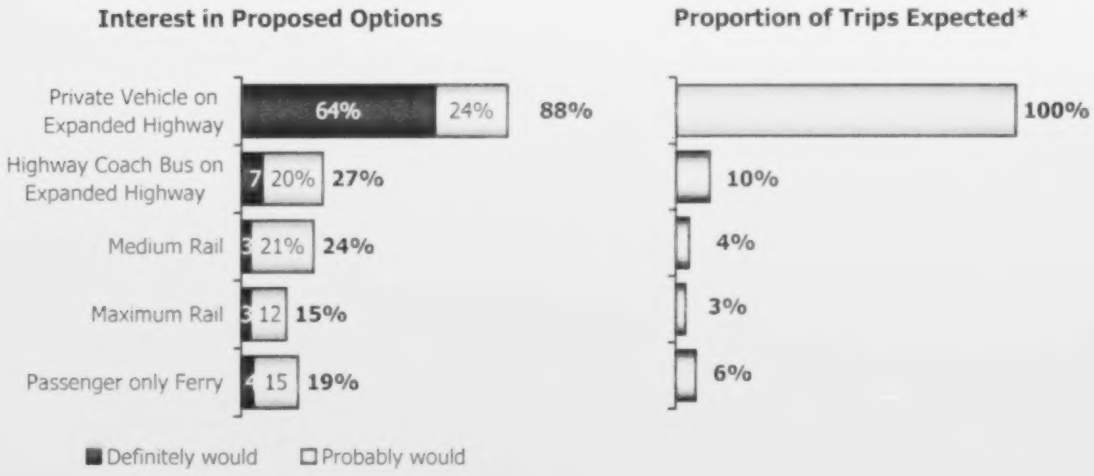
Respondents were asked to estimate the number of trips they would have taken using each option, had it been available for their travel along the Corridor in the most recent winter and most recent summer season. To assess the relative magnitude of potential consumer usage, an indexing method is used whereby the concept with the highest trip volume becomes the benchmark against which the other concepts are measured. Since consumers have a tendency to over-state their intentions in concept testing, a down-weighting calculation is used to attempt to arrive at a more realistic picture of relative usage. The method used here takes the stated expected volume of those who say "definitely" would use the proposed option plus 10% of trips stated by the "probably" would use group. Trip volumes were expanded to the 2001 population 16 years and over and account for the full calendar year.

In terms of volume share, the expanded highway option clearly has the greatest potential of the four options tested. Given the public's extensive use of this mode, mainly due to its convenience and accessibility, this outcome is expected. The anticipated trip comparisons illustrate dramatically that the private vehicle is well-entrenched as the mode of choice for BC residents who use the corridor.

For the other proposed new options overall trip proportions, relative to the private vehicle, fall in the range of 3-6% with ferry performing better than the rail options.

Note that the bus concept is in a sense a "control", since the service attributes presented were not altered from today's scheduled bus service. It generates higher expected trip volume than the rail and passenger-only ferry concepts. This might suggest that greater awareness of highway coach bus service would increase market share of this mode. It has the advantage of being able to compete with the speed of the auto and offers more accessibility and flexibility than the other proposed options.

Market Potential among Local BC Residents



Base: Local BC Corridor Travelers
(n=900, split sample for Rail concepts)

* Base: Indexed to Expected Trips by Private Vehicle[1]

[1] *Calculated for "Definitely and probably would use," volumes down-weighted to compensate for overstated intentions*

Detailed Findings
Whistler On-site Survey of Non-Resident Visitors

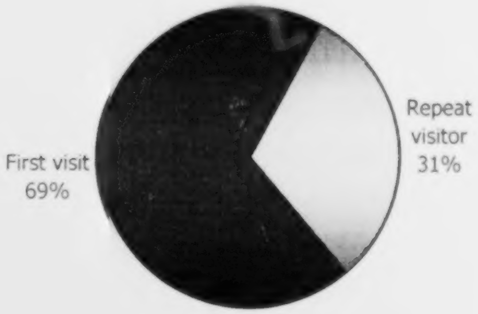
8.0 Introduction

This section presents findings on the travel habits among non-resident visitors to BC, conducted on-site in Whistler in October 6-9, 2001. Personal, intercept interviews were conducted throughout the Whistler Town Centre area among people whose area of residence is outside of BC (including Washington, Oregon, other US, other Canada and other International). Note that the profile of these visitors and their travel habits may, in some respects, be particular to the summer and shoulder season.

9.0 Frequency of Travel to Whistler among Non-Residents

The majority of non-residents are visiting Whistler for the first time (about 7-in-10).

Incidence of Previous Visits to Whistler Area



Base: Non-resident Visitors (n=211)

On-site SurveyQ1: Is this your first trip to the Whistler area?

As would be expected, the proportion of repeat visitors is notably higher among residents of the US West Coast (52%) and other parts of North America (39%) than among International visitors (about 16% have been to the Whistler area before).

Previous Visits to Whistler Area

		Area of Residence		
	Total Non-Resident Visitors (211) %	**US West Coast** (67) %	**Other North American** (138) %	**Other Country** (73) %
First visit	69 ▲	47	61	84 ▲
Repeat visitor	31	53 ▲	39	16

On-site Survey Q.1

Repeat visitors appear to average over nine trips to the Whistler area, but this average is skewed by a few extreme values. In this case, the median value of three trips is actually a better summation of the more typical habit.

Over half of these repeat visitors have been to Whistler in the winter season.

Familiarity with Visiting Whistler Area

	Total Non-Resident Repeat Visitors (66)
Number of visits (total)	#
Average no. of visits	*9.6*
Median no. of visits	***3***
Visited in winter	
Have visited in a winter season	57%

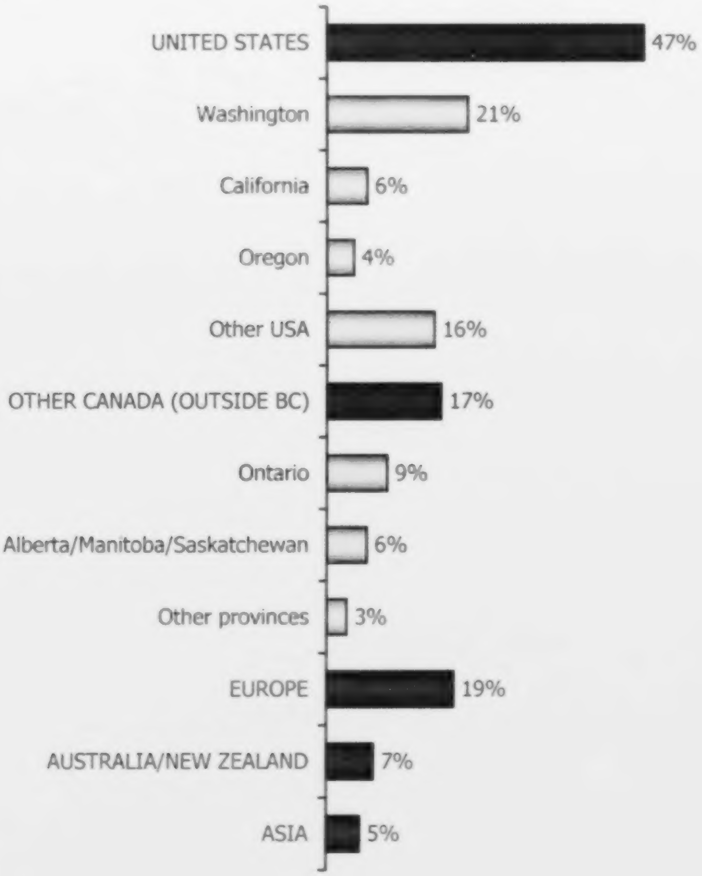
On-site Survey Q.1b): Counting this trip, how many times have you visited Whistler?
Q2: Have you ever visited the Whistler area in the winter season, that is the period from November through April?

10.0 Trip Characteristics among Non-Residents

10.1 Origin

Among non-residents visiting Whistler in the summer shoulder season, about half originated in the US. Europeans (19%) and visitors from the rest of Canada (17%) make up the next largest non-resident groups. Australian/New Zealand and Asian visitors were encountered less at this time (likely larger components in the winter season market). Note that the study was conducted in early October (after the September 11 terrorist attack on the US).

Area of Residence
(Shoulder Season Visitor)



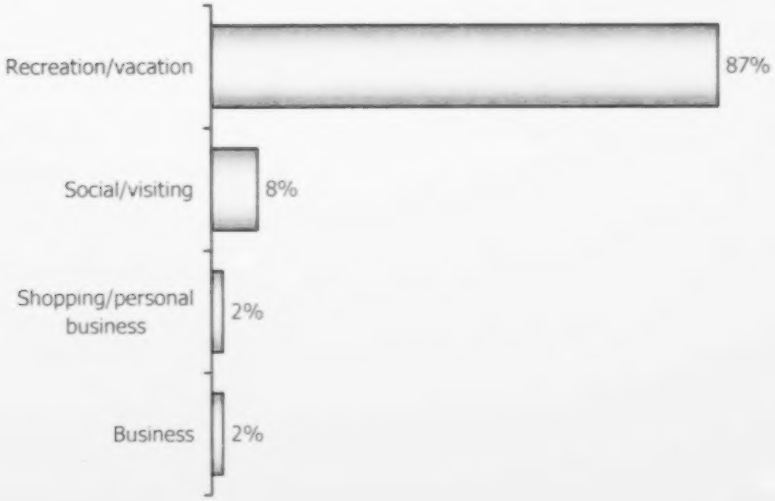
Base: Total Non-resident Visitors (n=211)

On-site Survey Q.e: Just to confirm, where is your primary residence?

10.2 Purpose of Trip

It comes as no surprise that non-residents of BC are predominantly recreational travelers.

Trip Purpose
(Non-resident Visitors)



Base: Total Non-resident Visitors (n=211)

On-site Survey Q.3a: What was the main purpose of this trip to Whistler?

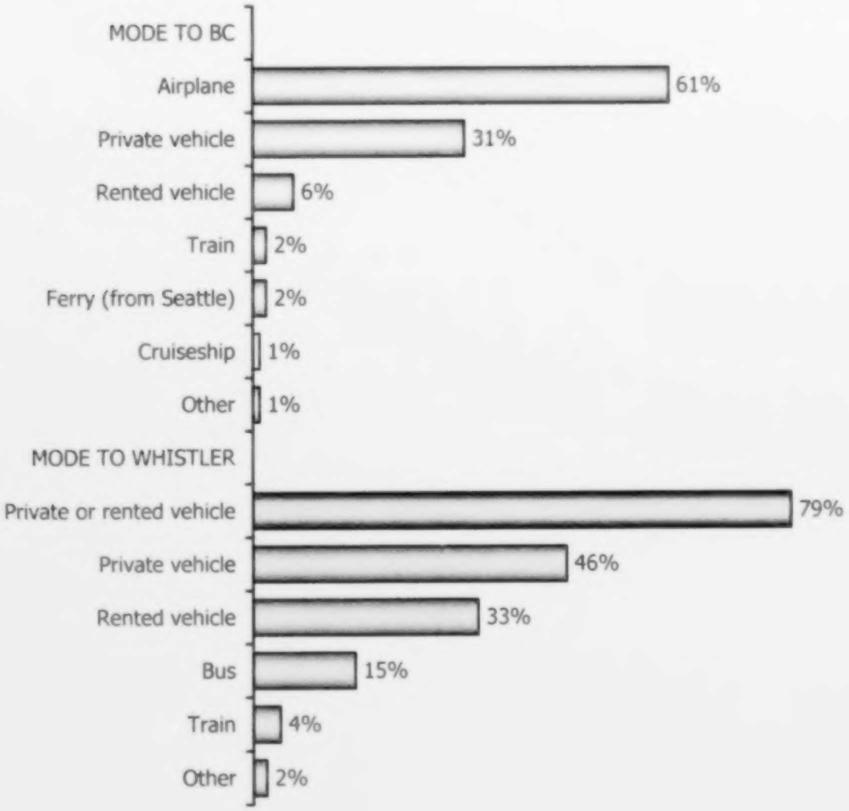
10.3 Mode of Transportation

10.3.1 Current Mode

A majority of non-resident visitors traveled **to BC** by airplane (61%) and most others have arrived by private vehicle (32%).

Travel **to Whistler** is predominantly by private vehicle (79%). Slightly more use private versus rented vehicles (46% versus 33%). In this shoulder-season study we found about 15% of non-resident visitors to be traveling to Whistler by bus. Train accounted for just 4% of respondents.

Mode of Transportation



Base: Total Non-resident Visitors (n=211)

On-site Survey Q3f/ Q3g: What mode of transportation did you use to travel to BC (from you home)? And what mode(s) of transportation did you use to travel to Whistler specifically?

10.3.2 Experience with Other Modes

Repeat visitors were asked if they had any experience using other modes of transportation on past trips to Whistler. About one-in-four say that they have tried other modes. In fact, about 8% of repeat visitors have switched away from bus and used private or rented vehicle on this trip. On the other hand, a similar proportion has done the reverse—previously using rented or private car, but having taken the bus in this excursion. (Those who switched from private to rented vehicle or the reverse are not considered "mode switchers").

Experience with Other Modes of Transportation to Whistler

	Total Non-BC Repeat Visitors (66) %
Used other modes to Whistler:	
No/ Don't recall	**74**
Yes	26
Private vehicle	4
Rented vehicle	11
Bus	8
Other	3

On-site Survey Q3h: Did you use any other modes of transportation on previous trips to Whistler? If so, which modes?

10.4 Party Size

Most non-resident visitors (93%) are traveling in parties of two or more. The average is three-person parties and the median is a party size of two.

Party Size

	Total Non-BC Visitors (211) %
One	8
Two	56
3-4	23
5 or more	12
Average party size	***3 persons***
Median	***2 persons***

On-site Survey Q.3b: How many people, including yourself, are in your party?

10.5 Trip Length

Since most non-residents are on recreational/vacation trips, the majority spends at least one overnight in the Whistler area (77%). In fact, the average is three nights.

Trip Length in Whistler Area

	Total Non-BC Visitors (211) %
Day trip only	23
Overnight	77 ▲
Average # nights in Whistler *Per total non-resident visitor*	***3 nights***
Median	***2 nights***

On-site Survey Q.3c: Is this a day trip or overnight trip to the Whistler area? How many nights in total will you spend in the Whistler area on this trip?

10.6 Other Overnight Stays in BC and Type of Accommodation

Prior to arriving in the Whistler area, a majority has had an overnight stay elsewhere in BC (61%) and about the same proportion plans an overnight after the Whistler visit before leaving the province. Most have stayed or will stay in the GVRD. On average, non-residents expect to spend 8-9 days in BC on this trip.

Overnight Stays Pre-/Post-Whistler Visit

	Total Non-BC Visitors (211)
Pre-Whistler Visit	%
No prior overnight stay	29
Prior overnight stay	71
GVRD	51
Other BC	10
Elsewhere	10
Post-Whistler Visit	
No plan for overnight in elsewhere in BC	42
Plan to overnight in elsewhere in BC	58
GVRD	37
Other BC	21
Total nights planned in BC	
Average # nights	***9 nights***
Median # nights	***7 nights***

On-site Survey Q3d and 5a/b: Just before arriving to the Whistler area did you spend a least one night away from home? Where was that?
Do you plan to stop for a overnight visit at any other destinations in BC?
How many nights in total will you spend in BC on this trip?

Among these shoulder season visitors who have already spent a night in BC prior to arriving in Whistler, about half had hotel/motel accommodations, while approximately one-third reported staying in private residences.

Type of Accommodation in Pre-Whistler Visit

	Total Spent a Night in BC Prior to Whistler Trip (128) %
Hotel/ motel	52
Private residence	32
Hostel	4
B&B	4
Recreational vehicle/motor home	3
Camping	1
Time-share	1

On-site Survey Q3e: If greater Vancouver/other BC: What type of accommodation did you have there?

11.0 Factors Influencing Mode-Choice among Non-residents

11.1 Rating of Selected Factors in Mode Decision-Making

Attitudinal questions on mode choice decision-making were posed to non-residents intercepted on-site in Whistler. Respondents were asked to rate five factors in terms of their influence on the mode of transportation they selected for this trip to Whistler. Some issues of particular relevance to non-resident visitors were included in this attribute list, such as luggage handling, transfers and travel agent input. The factors tested were: i) *Arriving and departing whenever you want*, ii) *Cost of transportation*, iii) *Ease of luggage handling*, v) *Number of transfers* and v) *Advice of travel agent*.

As found with local BC residents, flexibility in arrival and departure time is by far the most influential of these dimensions when non-residents choose how to travel to Whistler. Based on a five-point scale, where 5 is "extremely influential," over 6-in-10 non-resident visitors gave "*arriving and departing whenever you want*" the top score (5), "extremely influential" on their mode decision for this trip. This factor is awarded a score of "4 or 5" by over 80%, and it achieves the highest average score (4.3 out of 5).

Average scores for most of the remaining factors rank at similar levels (3.3 to 3.6), but *advice of travel agent* is considered the least influential (averaging just a 2.0). However, using an index that compares the gap between the highest and lowest rating reveals that the *number of transfers* may not be as influential as *ease of luggage handling* and *cost*.

Factors Influencing Mode Choice

	Total Non-BC Residents (211)
Average Rating of Factors (5=extremely influential, 1= not at all influential)	#
Arriving and departing whenever you want	4.3
Ease of luggage handling	3.6
Cost of transportation	3.6
Number of transfers	3.3
Advice of travel agent	2.0
INDEX = % highest rating - % lowest rating	
Arriving and departing whenever you want	+55▲
Ease of luggage handling	+21
Cost of transportation	+22
Number of transfers	+5
Advice of travel agent	-31 ▼

On-site Survey Q4: You mentioned using ____ on this trip to Whistler. When you were deciding on this mode of transportation, how much influence did the following factors have in your decision?

11.2 Other Factors of Significant Influence in Mode-Choice

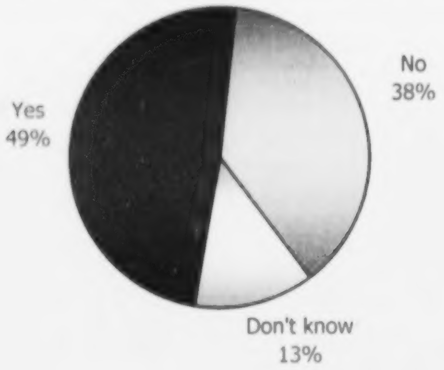
When respondents are asked if anything else had a significant influence on their decision to choose the mode selected for this trip, many convenience aspects of a private vehicle are noted. Specific mentions include (in order of magnitude):

- Simple fact that they already have a car and might as well use it.
- Ability to stop anywhere they want to.
- Ability to move around at the destination.
- Enjoyment of driving, the feeling of independence.
- Inconvenience of public transportation schedules.
- Lack of awareness or familiarity with the public transportation systems.
- Need to accommodate others (in a group, traveling with kids, pets).
- Comfort/privacy of a car (can smoke, listen to music, no crowds/strangers).

12.0 Receptiveness to Other Modes of Transportation

Non-residents were asked if they would entertain the idea of using other modes of transportation for traveling to Whistler. It is encouraging to find that non-resident visitors are very receptive to considering alternative modes. Half say they would consider other types of transportation for the trip. This level of enthusiasm is consistent across the demographic segments; furthermore, North Americans are as interested as International travelers. (Note that this question was asked before the concept testing).

Would Consider Using Other Modes to Whistler



Base: Total Non-resident Visitors (n=211)

On-site Survey Q.3-I: Now that you've been to Whistler, would you consider any other modes of transportation in the future?

13.0 Sea-to-Sky Transportation Options: Concept Testing

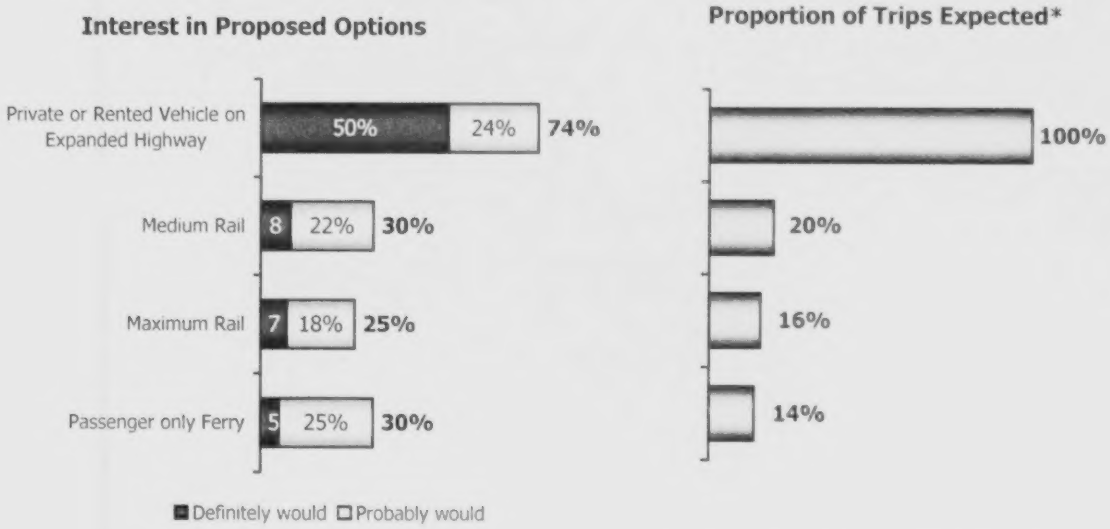
Interest in Using Proposed Options

The main transportation concepts were tested among non-resident visitors—expanded highway, medium rail, maximum rail and passenger-only ferry.

Expanded Highway: Private (or rented) vehicle is generally the mode of choice. Three-quarters of non-resident visitors say they're likely to use the private vehicle option, but only 50% say they "definitely would use" this mode. Note, about 8-in-10 traveled to Whistler by private or rented vehicle on this trip.

Other transportation choices: About 25-30% of non-residents show interest in the alternative mode options presented. As with local BC residents, only a limited number are strongly committed (5-8 % "definitely would use"). Interest in the alternative options appears stronger with non-residents than with local BC residents.

Market Potential
among Non-Residents



Base: Non-resident Visitors
(n=211, split sample for Rail concepts)

* Base: Indexed to Expected Trips by Private Vehicle[1]

On site survey Q6: If an expanded highway had been available, how likely would you have been to use a private or rented vehicle for this trip to Whistler? Would you say:

[1] *Calculated for "Definitely and probably would use," volumes down-weighted to compensate for overstated intentions.*

Attachments

1. Methodological Details
2. Report of Call Summary
3. Source Statistics
4. Questionnaires

Attachment 1

Methodological Details

1.1 Telephone Survey Methodology

Definition of Study Area

The study region has been defined to include the residents of eight sub-areas as follows:

1) Whistler
2) Squamish
3) Other corridor residents from Lion's Bay to Pemberton
4) GVRD North Shore (West Vancouver including Horseshoe Bay, North Vancouver)
5) GVRD north of Fraser (Port Moody, Coquitlam, Port Coquitlam, Maple Ridge, Pitt Meadows, Haney)
6) GVRD south of Fraser (Richmond, Delta, Ladner, Tsawwassen, White Rock, Surrey, Langley, Fort Langley)
7) Washington and Oregon States

Sample Selection

A random sample of households was selected in each of the defined sub-areas of the study region. The sample frame for BC was drawn from the Telus database of published, residential numbers (the most up-to-date source of changed and newly listed phone numbers in BC). Since the proportion of unlisted numbers is higher in the US, a random digit list of phone numbers was generated to ensure broad inclusion of the populace; this random list was then cleaned to remove unusable numbers. The frame was stratified into the eight geographic zones, noted above. A disproportionate sampling plan was devised to give adequate representation of STS users from the Corridor communities and allow separate analysis of these residents (detailed in the Weighting Procedures section below).

Random samples of households were drawn for each zone and a representative cross-section of interviews was completed in each zone. The sampling distribution within each zone was approximately proportionate to the population distribution.

Within each household the individual to be interviewed was chosen by a randomized technique (next birthday method). To ensure proper gender balance within the study region, alternate selection of males and females was employed. Probability of selection information was collected to later convert the sample of households into a sample of individuals, projectable to the area population.

Up to five calls were made in an attempt to obtain a completed interview with the selected household/individual, thereby reducing the effect of any possible non-response bias.

Data Collection

All interviews were completed September 18 to October 9, 2001 from McIntyre & Mustel's CATI (Computer Assisted Telephone Interviewing) centre, where trained telephone field staff are continuously supervised and monitored. Fieldwork was conducted weekday evenings and Saturday and Sunday daytimes. Note that interviews were distributed across the seven days of the week as evenly as possible.

Questionnaire/ Pre-testing

The questionnaire used in this study was developed in consultation with the client. A pre-test was conducted prior to the start of field work. The pre-test was monitored by representatives of TSi and McIntyre & Mustel Research, resulting in some minor modifications.

Weighting Procedures

Minor weighting adjustments have been applied to bring the resulting sample into correct proportion on the basis of key demographics. The following procedures were used to match the most recently available Statistics Canada and US Census data for the study region/study population. The 1996 Statistics Canada census data was used as a basis for making 2001 population projections. These census projections reflect an "aging" of the most recently available census distributions (i.e., adjusting age category counts by the number of years since the last census collection); these projections have also factored in the overall effects of immigration and mortality on the population totals. (See Source Statistics Appendix 3)

First, the probability of selection at the household level was applied, converting the sample of households into a sample of individuals 16 years of age and over. Next minor adjustments were applied to match the sample to 2001 census projections for the study area on the basis of age within gender. Regional weighting was then applied to bring the eight geographic zones into correct relative proportion to each other. These weights were applied to the cross-section sample (consisting of Sea-to-Sky users and non-users, therefore, representing the entire population 16 years of age and over in the study area). The resulting sample of Sea-to-Sky users and non-users is therefore representative of the study region.

The following table shows the distribution of actual and weighted interviews.

Distribution of Interviews

	BC Study Area Cross-section		Local BC STS Users	
	Actual (1,854) %	Weighted (8837280) %	Actual (900) %	Weighted (629753) %
Gender				
Male	49	48.9	55.1	58.9
Female	51	51.1	44.9	41.1
Age				
16 – 24	6.4	7.4	7.1	8.4
25 – 34	9.9	8.8	11.1	12.2
35 – 44	12.6	9.9	15.1	14.0
45 – 54	9.1	8.9	10.4	12.3
55 – 64	4.8	5.5	5.8	6.7
65 +	5.4	6.5	5.1	4.8
Refused	0.6	1.9	0.4	0.4
Zone				
STS Corridor				
Whistler	10.0	0.1	20.8	1.0
Squamish	10.2	0.1	20.8	1.7
Other Corridor	2.8	*	5.8	0.2
GVRD				
North Shore	11.4	1.6	14.6	13.1
Vancouver/Burnaby/New Westminster	15.3	7.5	14.6	43.7
Balance North of Fraser River	14.2	2.2	11.8	12.8
Balance South of Fraser River	17.0	6.2	11.8	27.4
Washington/Oregon	19.0	82.4		

Distribution of Interviews

	Washington/ Oregon Cross-section	
	Actual (354) %	Weighted (7281267) %
Gender		
Male	48.3	48.9
Female	51.7	51.1
Age		
16 – 24	4.5	7.4
25 – 34	9.9	8.3
35 – 44	11.6	9.7
45 – 54	10.5	9.0
55 – 64	4.5	5.6
65 +	5.1	6.6
Refused	2.3	2.3
Zone		
Washington	63.0	63.1
Oregon	37.0	36.9

To test the rail options, a split sample method was used, whereby half the respondents heard about the medium rail option and half about the maximum rail option. The two cells are matched on key demographic characteristics.

Data Analysis Notes

In order to project the trip volume data collected for the May to August period to the full summer season, an expansion factor of 1.4 was used.

In the calculation of trip estimations extreme values were removed. These are cases with trip frequencies so extremely different from the general mass of people that they exaggerate the average trip frequency. These extreme values have been removed from calculation of total trips, means and related statistics. These cases, however, are included in the data distributions and other data presented.

1.2 On-site Survey Methodology

An on-site survey was conducted among non-resident visitors to Whistler from October 6-9, 2001. Persons eligible for the survey were non-residents of BC, visiting the Whistler area. In total, 211 personal interviews were completed with qualifying respondents, who were intercepted throughout the Town Centre area. Interviewing locations included these locations (at or near): the Gondola, Moguls Restaurant, Market Place, corridor to the Market Place and the Conference Centre/Tourist Information Centre. Respondents are approached at random, in order to ensure a good mix of ages and types of people. In addition, the sample is balanced in terms of gender. Approximately half of the interview (110) were completed on the weekend (Saturday and Sunday) and the other half on a weekday (Monday and Tuesday).

The questionnaire was adapted from the telephone survey including basic travel habits, factors influencing the mode choice decision and reactions to the proposed transportation options. It also covered considerable different travel habit information (about pre- and post-Whistler travel habits) and mode-choice attributes more relevant to the non-resident market. A copy of the questionnaire is appended.

In the week preceding the field work the survey process and questionnaire was pre-tested on location in Whistler and required only minimal refinements. As with the telephone survey, about half the respondents tested the medium rail concept and half the maximum rail concept; minor weighting of the data was applied to match the cells.

Attachment 2

Report of Call Summary

Report of Calls

	Total BC Study Area	Total Washington/Oregon
Total Attempted:	**8352**	**3946**
Out of Scope	**936**	**1308**
Not in service/number changed/moved	723	930
Modem/fax line/business	310	378
Total Potential:	**7415**	**2638**
No answer/busy	1154	935
Answering machine	1044	513
Respondent not available	548	99
Contacts	**3007**	**725**
Refused/terminated partway	2593	633
Language/communication problem	414	92
Willing participants	**1662**	**366**
Quota full	152	12
Total Completions (Qualifiers and Non-qualifiers)	**1510**	**354**
Non-qualifier - Non-user (short survey)	610	344
Qualifier - STS user (long survey)	900	10
Contacts (% of potential)	40.5	27.5
Willing participants (% of potential)*	22.4	13.8

* Note that these response rates are typical for this type of market research.

Attachment 3

Source Statistics

2001 Projections

Study Area Population Aged 16 years and over

Category	TOTAL STUDY REGION	Total Wash/ Oregon	Washing-ton	Oregon	Total BC Study Area	Total STS Corridor	Whistler	Squamish	Other Corridor	Total GVRD	North Shore	Van/ Bby/NW	Bal. GVRD N. of River	Bal. GVRD S. of River
Total Male	***4,317,312***	***3,559,987***	***2,253,071***	***1,306,916***	***757,325***	***9,896***	***3,644***	***5,550***	***702***	***747,429***	***65,707***	***322,478***	***94,368***	***264,876***
M 16-24	680,723	563,956	359,708	204,248	116,767	*1,834*	860	890	84	114,933	9,465	47,371	14,678	43,419
M 25-34	806,335	637,525	410,143	227,382	168,810	*2,736*	1,454	1,200	82	166,074	11,070	81,952	20,360	52,692
M 35-44	907,386	740,722	476,066	264,656	166,664	*2,311*	773	1,372	166	164,353	14,252	67,408	23,798	58,895
M 45-54	817,248	687,324	433,010	254,314	129,924	*1,577*	375	1,007	195	128,347	13,006	50,240	16,948	48,153
M 55-64	505,187	425,100	266,026	159,074	80,087	*809*	133	563	113	79,278	8,073	33,292	9,488	28,425
M 65+	600,433	505,360	308,118	197,242	95,073	*629*	49	518	62	94,444	9,841	42,215	9,096	33,292
Total Female	***4,519,975***	***3,721,287***	***2,342,785***	***1,378,502***	***798,688***	***8,838***	***2,745***	***5,391***	***702***	***789,850***	***73,588***	***339,036***	***97,793***	***279,433***
F 16-24	646,708	530,699	336,792	193,907	116,009	*1,503*	607	810	86	114,506	9,293	48,877	14,085	42,251
F 25-34	774,102	604,236	387,401	216,835	169,866	*2,548*	1,174	1,265	109	167,318	12,372	78,911	21,596	54,439
F 35-44	928,291	756,260	484,451	271,809	172,031	*2,109*	558	1,376	175	169,922	15,990	67,335	24,434	62,163
F 45-54	826,560	697,008	438,458	258,550	129,552	*1,308*	270	852	186	128,244	13,673	50,083	16,232	48,256
F 55-64	525,267	445,059	277,609	167,450	80,208	*714*	105	518	91	79,494	8,455	33,540	9,250	28,249
F 65+	819,047	688,025	418,074	269,951	131,022	*656*	31	570	55	130,366	13,805	60,290	12,196	44,075
Total Region	***8,837,287***	***7,281,274***	***4,595,856***	***2,685,418***	***1,556,013***	***18,734***	***6,389***	***10,941***	***1,404***	***1,537,279***	***139,295***	***661,514***	***192,161***	***544,309***
% of Total Study Area	*100.00%*	*82.39%*	*52.01%*	*30.39%*	*17.61%*	*0.21%*	*0.07%*	*0.12%*	*0.02%*	*17.40%*	*1.58%*	*7.49%*	*2.17%*	*6.16%*
Total Ages	***8,837,287***	7,281,274	4,595,856	2,685,418	1,556,013	***18,734***	6,389	10,941	1,404	1,537,279	139,295	661,514	192,161	544,309
16-24	1,327,431	1,094,655	696,500	398,155	232,776	*3,337*	1,467	1,700	170	229,439	18,758	96,248	28,763	85,670
25-34	1,580,437	1,241,761	797,544	444,217	338,676	*5,284*	2,628	2,465	191	333,392	23,442	160,863	41,956	107,131
35-44	1,835,677	1,496,982	960,517	536,465	338,695	*4,420*	1,331	2,748	341	334,275	30,242	134,743	48,232	121,058
45-54	1,643,808	1,384,332	871,468	512,864	259,476	*2,885*	645	1,859	381	256,591	26,679	100,323	33,180	96,409
55-64	1,030,454	870,159	543635	326,524	160,295	*1,523*	238	1,081	204	158,772	16528	66832	18738	56674
65+	1,419,480	1,193,385	726192	467,193	226,095	*1,285*	80	1,088	117	224,810	23646	102505	21292	77367

% of Total Study Area	**Male**	*48.85%*	**16-24**	*15.02%*	**35-44**	*20.77%*	**55-64**	*11.66%*
	Female	*51.15%*	**25-34**	*17.88%*	**45-54**	*18.60%*	**65+**	*16.06%*

Attachment 4

Questionnaires

Residential Telephone Survey

Hello, my name is ___ of McIntyre & Mustel Research, a professional opinion research company in Vancouver. Today we are talking to residents of (NAME AREA: Whistler/Squamish, Sea to Sky Corridor, Greater Vancouver, Oregon, Washington) to get their opinions on transportation needs for the region [IF WASH/ORE: Cascadia region]. This is strictly a survey to help plan transportation; please be assured we are not selling anything.

Persuaders (ON HELP SCREEN):
Your responses to the survey topics will help plan important transportation services for residents of your area.
Because you have been selected at random, you represent many others in your area and your participation is important.
All responses are strictly confidential.
The survey can be as short as 3 minutes or up to 15-20 minutes, depending on your answers.

First of all, just to randomize our interviews, may I please speak to the male/female in this household who is 16 years of age and over and whose birthday comes next. **RE-INTRODUCE IF NECESSARY.**

GENDER: 1= MALE; 2= FEMALE

C. Just to confirm, where is your primary residence? DO NOT READ
IF DIFFERENT FROM SAMPLE AREA, END INTERVIEW

Whistler
Squamish (including Brackendale and Garibaldi Highlands)
Other Sea to Sky Corridor community/area
Greater Vancouver → In which municipality? INSERT LIST
Washington State (CONFIRM STATE)
Oregon State (CONFIRM STATE)
OTHER → PROBE WITH ABOVE IF NEEDED; END INTERVIEW IF NONE OF ABOVE

SCREENER
BC RESIDENTS → GO DIRECTLY TO Q1b
1a. WASHINGTON/OREGON RESIDENTS ONLY: Have you traveled to British Columbia in the past year?

NO → Since you are not a recent traveler to BC, we have just a few quick demographic questions to help us make sure our sample represents all groups of people. GO TO BASIC DATA& ONLY ASK Qii, iii, iv (household size, probability of selection, age)
YES → CONTINUE

1b. Our study concerns travel along the Sea to Sky Corridor, that is the region from Lion's Bay, just north of (OREGON and WASHINGTON read Vancouver, BC) Horseshoe Bay, all the way up to Whistler. In the past year have you, yourself, traveled anywhere along the Sea to Sky Corridor by private vehicle, bus or train?

YES → CONTINUE
NO → Since you are not a recent traveler, we have just a few quick demographic questions to help us make sure our sample represents all groups of people. GO TO BASIC DATA & ONLY ASK Qii, iii, iv (household size, probability of selection, age)

ASK ALL EXCEPT WASH/ORE RESIDENT
1c. Do you regularly commute to work or school in a different municipality by travelling along the Sea to Sky Corridor?
YES: Work/School
IF YES: **c-i)** To which municipality? INSERT LIST
c-ii) How many days a week do you commute to your work site/school?___

CURRENT TRAVEL BEHAVIOUR

We'd like to talk about your trips by private vehicle, bus or train, anywhere along the Sea to Sky Corridor, again, that is the region from Lion's Bay (just north of Horseshoe Bay/IF WASH/ORE SAY: just north of Vancouver) all the way up to Whistler. [The rest of the survey averages about 15 minutes, depending on your answers.]

2. First I'd like you to think about the **most recent winter season** that is, from November 2000 to April 2001 Did you travel (WHISTLER/SQUAMISH/OTHER CORRIDOR: to or from a different community) on the Sea to Sky Corridor at least once during this time period?

YES → In an average week or month **or** over the whole winter season, how many trips did you take along the Sea to Sky Corridor from November through April? **CONFIRM NUMBER AND ASK: Per week or per month or per season? Is that one-way or round trips?** RECORD AS RESPONDENT ANSWERS.

ONE-WAY TRIPS: # ___ per week # ___ per month # ___ per season
ROUND TRIPS: # ___ per week # ___ per month # ___ per season

NO

IF NO/DK TO Q2 → SKIP TO Q4. IF YES→ CONTINUE.

3. Next, thinking of your most recent winter trip along the Sea to Sky Corridor...
3a) What was your place of origin? READ LIST IF NECESSARY (SEE LIST BELOW)
3b) And what was your final destination? READ LIST IF NECESSARY (SEE LIST BELOW)

IF NECESSARY: "Destination" = final destination or farthest point, including transfer points to ferry or plane, bus or rail.
YELLOW HIGHLIGHTED TEXT → FOR GVRD AND WASH/ORE RESIDENTS

ORIGIN-DESTINATION LIST: READ ONLY IF NECESSARY
Whistler BC
Squamish BC (incl Brackendale, Garibaldi Highlands)
Any other destination along the Sea to Sky Corridor – that is, between Lion's Bay and Whistler, including parks and recreation sites along the way (INCLUDE: Lion's Bay, Porteau Cove, Britannia Beach, Furry Creek, parks/recreation sites along the way) SPECIFY:______________________

Greater Vancouver destinations or transfer points→ PROBE: To/from which Greater Vancouver municipalities? (INCLUDE TRANSFER POINTS – e.g., ferry, cruise, airport, Greyhound bus terminals) DO NOT READ UNLESS NECESSARY. PROBE FULLY.
The North Shore (INCL. Horseshoe Bay, the ferry terminal, West Vancouver, North Vancouver)
City of Vancouver, Burnaby or New Westminster (INCL. cruise, train and bus terminals)
Other Greater Vancouver north of the Fraser River (INCL. Port Moody, Coquitlam, Port Coquitlam, Maple Ridge, Pitt Meadows, Haney)
Other Greater Vancouver south of the Fraser River (INCL. Vancouver International Airport, Richmond, Surrey, Langely/Ft. Langley, Delta/ Ladner/Tsawwassen/ferry, White Rock)
Other specify __________________ (RE-CODE ABOVE)

Washington State or Oregon State
OTHER

3c) What was the main purpose of your most recent winter trip on the Sea to Sky Corridor?

* Commuting to/from work or school
Recreation/vacation
Social visiting friends/family
Shopping
Business (job/work-related – IF COMMUTING, CODE ABOVE *)
Personal business (e.g., medical/dental/legal, etc)

3d) How many people, including yourself, were in your trip party? ___

3e) And what modes of transportation did you use on your most recent winter trip (RECORD ALL MENTIONS)?
Private vehicle → Was that: ☐ alone as a driver (SOV) or ☐ shared with others
Bus
Train
Other

3f) Was this most recent winter trip a day trip?

YES **3f-i)** PROBE: weekday or weekend?,
NO → **3f-ii)** How many nights did you spend at your destination? ___
3f-iii) Did it cover a weekend? YES (all or part of weekend) /NO

4. Next, I'd like you to think about the **current summer season** that is, from May through August of 2001.... Did you travel on the Sea to Sky Corridor at least once during this time period?

YES → In an average week or average month or over the whole summer season, how many trips did you take along the Sea to Sky Corridor from May through August? **CONFIRM NUMBER AND ASK: Per week or per month or per season? Is that one-way or round trips?** RECORD AS RESPONDENT ANSWERS.

ONE-WAY TRIPS:	# ___ per week	# ___ per month	# ___ per season
ROUND TRIPS:	# ___ per week	# ___ per month	# ___ per season

NO

IF NO/DK TO Q4 → SKIP TO Q6. IF YES→ CONTINUE.

5. Next, thinking of your most recent summer trip along the Sea to Sky Corridor....
5a) What was your place of origin? READ LIST IF NECESSARY (SEE LIST BELOW)
5b) And what was your final destination? READ LIST IF NECESSARY (SEE LIST BELOW)

IF NECESSARY: "Destination" = final destination or farthest point, including transfer points to ferry or plane, bus or rail.. DO NOT ROTATE ORDER.

ORIGIN-DESTINATION LIST: READ ONLY IF NECESSARY
Whistler BC
Squamish BC
Any other destination along the Sea to Sky Corridor – that is, between Lion's Bay and Whistler, including parks and recreation sites along the way (INCLUDE: Lion's Bay, Porteau Cove, Britannia Beach, Brackendale, Furry Creek, parks/recreation sites along the way)
SPECIFY ___________

Greater Vancouver destinations or transfer points→ PROBE: To/from which Greater Vancouver municipalities? (INCLUDE TRANSFER POINTS – e.g., ferry, cruise, airport, Greyhound bus terminals) DO NOT READ UNLESS NECESSARY. PROBE FULLY.
The North Shore (INCL. Horseshoe Bay, the ferry terminal, West Vancouver, North Vancouver)
City of Vancouver, Burnaby or New Westminster (INCL. cruise, train and bus terminals)
Other Greater Vancouver north of the Fraser River (INCL. Port Moody, Coquitlam, Port Coquitlam, Maple Ridge, Pitt Meadows, Haney)
Other Greater Vancouver south of the Fraser River (INCL. Vancouver International Airport, Richmond, Surrey, Langely/Ft. Langley, Delta/ Ladner/Tsawwassen,/ferry, White Rock)
Other specify ____________________ (RE-CODE ABOVE)

Washington State or Oregon State
OTHER

5c) What was the main purpose of your most recent summer trip on the Sea to Sky Corridor?

* Commuting to/from work or school
Recreation/vacation
Social visiting friends/family
Shopping
Business (job/work-related IF COMMUTING, CODE ABOVE *)
Personal business (e.g., medical/dental/legal, etc)

5d) How many people, including yourself, were in your trip party? ___

5e) And what modes of transportation did you use on your most recent summer trip (RECORD ALL MENTIONS)?

Private vehicle → Was that: ☐ alone as a driver (SOV) or ☐ shared with others
Bus
Train
Other

5f) Was this most recent trip a day trip or overnight?

YES **3f-i)** PROBE: weekday or weekend?,
NO → **3f-ii)** How many nights did you spend at your destination? ___
3f-iii) Did it cover a weekend? YES (all or part of weekend) /NO

6. ***SELECT ONE TRIP TYPE (WINTER OR SUMMER) BASED ON THE ONE WITH THE HIGHER FREQUENCY; IF EQUAL CHOOSE ONE AT RANDOM.***

6a) Next I'd like you to think specifically about your most recent trip this past [winter/summer] season . I'm going to read a list of reasons that may have influenced your decision to use [INSERT MOST RECENT MODE] instead of [INSERT MODES NOT SELECTED] on that trip. Here is the list: READ ENTIRE LIST. Which one of these items had the greatest influence?. READ LIST AGAIN. CODE RESPONSE AS "1".

And which one had the second greatest influence? READ REMAINING ITEMS. CODE 2ND CHOICE AS "2"

I'd like you to rank the remaining items in order from most to least influential in your decision to choose to travel by [INSERT MOST RECENT MODE]. READ REMAINING ITEMS. REPEAT UNTIL ALL ARE RANKED FROM "1 TO 5" .IT IS OK TO RANK MORE THAN ONE FACTOR AT THE SAME LEVEL.

RANKING
1= most influential; 2=second most; 3=third most; 4=fourth most; 5=least influential

_____ Cost of transportation
_____ Arriving and departing whenever you want
_____ Total travel time
_____ Comfort of the ride
_____ Having a unique travel experience

6b) Is there anything we have not mentioned that had a significant influence on your decision to choose [INSERT MOST RECENT MODE(S)] over other available modes of transportation on that trip? (IF YES: What would that be?) PROBE FOR SPECIFICS.

NO/NOTHING

____

CONCEPT TESTING SECTION

Now, I'd like to tell you about some possible transportation choices for the Sea to Sky Corridor. Some of these choices describe changes to transportation methods currently available, while others are new. I'll describe the possible transportation choices and then ask about your likelihood to use each one.

ROTATE OPTIONS. PROGRAMMER TO IDENTIFY ORDER OF PRESENTATION.
INTERVIEWERS: SEE HELP PAGE APPENDED AS NEEDED FOR SUMMARY OF OPTIONS (COST AND TIME)

Here is one possible change that could be made....

ROTATION (1): HIGHWAY → ALL RESPONDENTS
READ BEFORE OPTION 1 & 2: The **Sea-to-Sky highway would be expanded** to 4 lanes between Horseshoe Bay and Squamish, which is about half-way between Vancouver and Whistler. The portion of highway from Squamish to Whistler would remain 2 lanes, but there would be road safety and spot improvements along the route. ROTATE ORDER OF READING OPTION 1 & 2.

One transportation choice on the expanded highway would be to travel by___:

(OPTION 1) **private vehicle**. Highway travel time by private vehicle from Downtown Vancouver would average about one hour to Squamish and about one and three-quarter hours to Whistler. Cost of gas and vehicle maintenance averages about $8 one-way from Vancouver to Squamish and $16 one-way from Vancouver to Whistler.

7a. With an expanded highway, how likely would you be to use a private vehicle for your Sea to Sky Corridor trips? *Would you say: definitely, probably, might or might not, probably not or definitely not?*
IF "DEFINITELY/PROBABLY/MIGHT OR MIGHT NOT USE" IN 7a, CONTINUE.

7b. IF Q2 >0: You mentioned taking [INSERT # TRIPS AS REPORTED IN Q2 during this past winter season. If the expanded highway had been available... how many trips would you have taken in an average week or month **or** over the whole season, **by private vehicle** in the November to April period? **CONFIRM NUMBER AND CONFIRM: Per week or per month or per season? Is that one-way or round trips?** RECORD AS RESPONDENT ANSWERS.

ONE-WAY TRIPS: # __ per week # __per month # __per season __novelty/just to try it
ROUND TRIPS: # __ per week # __per month # __per season __novelty/just to try it

7c. IF Q4 >0: And you said you took [INSERT # TRIPS AS REPORTED IN Q2 during this past summer season. If the expanded highway had been available... how many trips would you have taken in an average week or month **or** over the whole season, **by private vehicle** in the May to August period? **CONFIRM NUMBER AND CONFIRM: Per week or per month or per season? Is that one-way or round trips?** RECORD AS RESPONDENT ANSWERS.

ONE-WAY TRIPS: # __ per week # __per month # __per season __novelty/just to try it
ROUND TRIPS: # __ per week # __per month # __per season __novelty/just to try it

(2) Another transportation choice on the expanded highway I just described would be to travel by ___:_REPEAT EXPANDED HIGHWAY DESCRIPTION IF NEEDED.

***(OPTION 2)* bus**. A highway coach bus service would run between Downtown Vancouver and Whistler with stops in Squamish and along the route. Buses would be available at least 7 times daily in each direction. The adult fare would be approximately $8 one-way from Downtown Vancouver to Squamish and approximately $20 one-way from Downtown Vancouver to Whistler. Total travel time by highway coach, including wait and boarding, from Downtown Vancouver would be about one and three-quarter hours to Squamish and three hours to Whistler.

8a. How likely would you be to use this bus service? *Would you say: definitely, probably, might or might not, probably not or definitely not?*

IF PROBABLY NOT/DEFINITELY NOT → SKIP TO NEXT SECTION
IF "DEFINITELY/PROBABLY/MIGHT OR MIGHT NOT USE" IN 8a, CONTINUE:

8b. IF DEF/PROB/MIGHT IN Q8a AND Q2 >0: You mentioned taking [INSERT # TRIPS AS REPORTED IN Q2 during this past winter season. If the expanded highway had been available... how many trips would you have taken in an average week or month **or** over the whole season, **by highway coach bus** in the November to April period? **CONFIRM NUMBER AND CONFIRM: Per week or per month or per season? Is that one-way or round trips?** RECORD AS RESPONDENT ANSWERS.

ONE-WAY TRIPS: # __ per week # __per month # __per season __novelty/just to try it
ROUND TRIPS: # __ per week # __per month # __per season __novelty/just to try it

8c. IF DEF/PROB/MIGHT IN Q9a AND Q4 >0: You said you took [INSERT # TRIPS AS REPORTED IN Q2 during this past summer season. If the expanded highway had been available..., how many trips would you have taken in an average week or month **or** over the whole season, **by highway coach bus** in the May to August period? **CONFIRM NUMBER AND CONFIRM: Per week or per month or per season? Is that one-way or round trips?** RECORD AS RESPONDENT ANSWERS.

ONE-WAY TRIPS:# __ per week # __per month # __per season __novelty/just to try it
ROUND TRIPS: # __ per week # __per month # __per season __novelty/just to try it

Here is another possible transportation change...

ROTATION (2) – RAIL → SPLIT CELLS: RESPONDENTS HEAR OPTION 3a OR OPTION 3b:
CELL 1: (OPTION 3a MEDIUM RAIL). BC Rail **train** service with comfortable up-to-date passenger cars would run between North Vancouver, Squamish and Whistler. The frequency of trains would increase to 3 trains per day in each direction. The adult fare from North Vancouver would be $25 one-way to Squamish and $50 one-way to Whistler. Total travel time from the North Vancouver train station would be about 2 hours to Squamish and about 3 hours to Whistler, including wait and boarding time. To get to the North Vancouver train station from Downtown Vancouver would take approximately 20 minutes by SeaBus or 30 minutes by private vehicle. Note that the train station would be re-located to be close to SeaBus, regional bus connections and a parking facility.
OR
CELL 2: (OPTION 3b MAXIMUM RAIL) BC Rail **train** service with comfortable up-to-date passenger cars plus improvements to the track, would run between North Vancouver, Squamish and Whistler. ...The frequency of trains would increase to 3 trains per day in each direction. The adult fare from North Vancouver would be $35 one-way to Squamish and $70 one-way to Whistler. Total travel time from the North Vancouver train station would be about one and three-quarter hours to Squamish, and about two and three-quarter hours to Whistler, including wait and boarding time. ... To get to the North Vancouver train station from Downtown Vancouver would take approximately 20 minutes by SeaBus or 30 minutes by private vehicle. Note that the train station would be re-located to be close to SeaBus, regional bus connections and a parking facility.

9a. How likely would you be to use this train service? *Would you say: definitely, probably, might or might not, probably not or definitely not?*
IF PROBABLY NOT/DEFINITELY NOT → SKIP TO NEXT SECTION
IF "DEFINITELY/PROBABLY/MIGHT OR MIGHT NOT USE" IN 9a, CONTINUE:

9b. IF DEF/PROB/MIGHT IN Q9a AND Q2 >0: You mentioned taking [INSERT # TRIPS AS REPORTED IN Q2] during the past winter season. If this train service had been available...how many trips would you have taken in an average week or month **or** over the whole season, **by train** in the November to April period? **CONFIRM NUMBER AND CONFIRM: Per week or per month or per season? Is that one-way or round trips?** RECORD AS RESPONDENT ANSWERS.

ONE-WAY TRIPS:# __ per week # __per month # __per season __novelty/just to try it
ROUND TRIPS: # __ per week # __per month # __per season __novelty/just to try it

9c. IF DEF/PROB/MIGHT IN Q9a AND Q4 >0: You said you took[INSERT # TRIPS AS REPORTED IN Q2 during the past summer season. If this train service had been available..., how many trips would you have taken in an average week or month **or** over the whole season, **by train** in the May to August period? **CONFIRM NUMBER AND CONFIRM: Per week or per month or per season? Is that one-way or round trips?** RECORD AS RESPONDENT ANSWERS.

ONE-WAY TRIPS:# __ per week # __per month # __per season __novelty/just to try it
ROUND TRIPS: # __ per week # __per month # __per season __novelty/just to try it

And here is one last transportation change I'd like to describe...

ROTATION (3): PASSENGER-ONLY FERRY → ALL RESPONDENTS
(OPTION 4) A **passenger-only ferry** service would operate between Downtown Vancouver and Squamish. In Squamish there would be bus connections to Whistler. The passenger-only ferry service would run 4 times per day in each direction. Total travel time from Downtown Vancouver to Squamish would be about one hour, including wait and boarding time. To take the passenger-only ferry plus connecting bus to Whistler would take an average of two and three-quarter hours, including wait, transfer and travel times. The cost of the passenger-only ferry would be $25 one-way to Squamish and $35 one-way for ferry-bus service to Whistler.

10a. How likely would you be to use this passenger-only ferry service? *Would you say: definitely, probably, might or might not, probably not or definitely not?*
IF PROBABLY NOT/DEFINITELY NOT → SKIP TO NEXT SECTION
IF "DEFINITELY/PROBABLY/MIGHT OR MIGHT NOT USE" IN 10a, CONTINUE:

10b. IF DEF/PROB/MIGHT IN Q10a AND Q2 >0: You mentioned taking [INSERT # TRIPS AS REPORTED IN Q2 the past winter season. If this passenger-only ferry service had been available... how many trips would you have taken in an average week or month **or** over the whole season, **by this ferry** in the November to April period? **CONFIRM NUMBER AND CONFIRM: Per week or per month or per season? Is that one-way or round trips?** RECORD AS RESPONDENT ANSWERS.

ONE-WAY TRIPS: # __ per week # __per month # __per season __novelty/just to try it
ROUND TRIPS: # __ per week # __per month # __per season __novelty/just to try it

10c. IF DEF/PROB/MIGHT IN Q10a AND Q4 >0: You said you took [INSERT # TRIPS AS REPORTED IN Q2 this past summer season. If this passenger-only ferry service had been available..., how many trips would you have taken in an average week or month **or** over the whole season, **by this ferry** in the May to August period? **CONFIRM NUMBER AND CONFIRM: Per week or per month or per season? Is that one-way or round trips?** RECORD AS RESPONDENT ANSWERS.

ONE-WAY TRIPS: # __ per week # __per month # __per season __novelty/just to try it
ROUND TRIPS: # __ per week # __per month # __per season __novelty/just to try it

DEMOGRAPHICS SECTION
Finally, a few questions to help us make sure our sample represents all groups of the population.

i. Do you own property in any location other than your home municipality?

NO
YES: → PROBE: If so, where? DO NOT READ. Any other?
WHISTLER
SQUAMISH
PEMBERTON
OTHER SEA TO SKY CORRIDOR ((INCLUDE: LION'S BAY, PORTEAU COVE, BRITANNIA BEACH, BRACKENDALE, FURRY CREEK, PEMBERTON, OTHER LOCATIONS ALONG THE WAY)
GVRD
ELSEWHERE

ii. Including yourself, how many people reside in your household? ____

iii. And how many are male/female 16 years of age and over, including yourself? ___

iv. Into which of the following age groups can I place you?

16-24 years
25-34 years
35-44 years
45-54 years
55-64 years
65 years and over

v. What is your present employment status?
Homemaker
Employed full-time (30 hrs or more per week)
Employed part-time (less than 30 hrs per week)
Student
Retired
Not employed
REFUSED

vi. Into which of the following broad income groupings does your annual household income, before taxes, fall?

Under $50,000
    Under $30,000
    $30,000 to $50,000
$50,000 or more
    $50,000 to 75,000
    $75,000 to 100,000
    $100,000 or more
DON'T KNOW
REFUSED

vii. If follow-up research were to be conducted sometime in the next year on this or related topics, would you be interested in participating?
YES
NO
DON'T KNOW

In case my supervisor needs to verify that I completed this survey, may I please have your first name or initial.

I want to thank you very much for participating in our survey; we appreciate your input. Have a pleasant day/evening.

INTERVIEWER HELP CHART (TO ASSIST IN RESPONDENT QUERIES):

ONE-WAY COST/TIME	*Private Vehicle*	*Bus*	*Med. Train*	*Max. Train*	*Passenger Ferry* ***+ Bus***
Average Cost *NO ACCESS COST*					
Vanc – Squamish	*$8*	*$8*	*$25*	*$35*	*$25*
Vanc – Whistler	*$16*	*$20*	*$50*	*$70*	*$35* *ferry-bus*
Average Time [=TRAVEL +WAIT] NO ACCESS TIME					
Vanc – Squamish	*1 hr* ***(55m)***	*1¾ hr* ***(100m)***	*2 hr* ***(115m)***	*1¾ hr* ***(100m)***	*1 h* ***(65m)***
Vanc – Whistler	*1¾ hr* ***(100m)***	*3 hr* ***(175m)***	*3 hr* ***(185m)***	*2¾ hr* ***(160m)***	*2¾ hr* ***(160 m)***

Hello, my name is ___ of McIntyre & Mustel Research, a professional opinion research company. Today we are conducting a brief survey among visitors to Whistler who live outside of British Columbia. This is strictly a survey to help plan transportation services for tourists; please be assured we are not selling anything.

Persuaders :

- Your responses will help plan important transportation services for visitors to Whistler
- All responses are strictly confidential.
- The survey averages about 5-7 minutes, depending on your answers.

A. **GENDER:** ☐ MALE ☐ FEMALE

B. **DAY OF INTERVIEW:** ☐ Sat ☐ Sun ☐ Mon ☐ Tue

C. **LOCATION OF INTERCEPT:** ____________________

D. **In the past week have you completed a transport-related survey here at Whistler (with McIntyre & Mustel Research)?** IF YES, THANK AND TERMINATE. OTHERWISE CONTINUE.

E. Just to confirm, where is your primary residence? DO NOT READ

☐ BC → THANK, END & TALLY NON-QUALIFIERS BELOW:

☐ LOWER MAINLAND/FRASER VALLEY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
☐ OTHER BC → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

☐ Washington State
☐ Oregon
☐ California
☐ Other USA (specify) ____________________
☐ Other Canada (specify) ____________________
☐ Other country (specify) ____________________
☐ OTHER → PROBE WITH ABOVE IF NEEDED

1. **Is this your first trip to the Whistler area?**

☐ YES → SKIP TO Q3
☐ NO → **1b)** Counting this trip, how many times have you visited Whistler? WRITE IN # ______

2. IF "Q1= NO": **Have you ever visited the Whistler area in the winter season, that is in the period from November through April?** ☐ YES ☐ NO

3. (Now) I'd like to ask specifically about your current trip to Whistler.

3a) What was the main purpose of this trip to Whistler? READ IF NECESSARY

☐ Recreation/vacation
☐ Social visiting friends/family
☐ Shopping
☐ Business (job/work-related, business conference/seminar)
☐ Personal business (e.g., medical/dental/legal, etc)

3b) How many people, including yourself, are in your trip party? ______

3c) Is this a day trip or overnight trip to the Whistler area?

☐ DAY TRIP
☐ OVERNIGHT → **3c-i)** How many nights in total will you spend in the Whistler area on this trip? _____

3d) Just before arriving to the Whistler area , did you spend at least one overnight away from home?
RECORD LAST OVERNIGHT BEFORE ARRIVING IN WHISTLER AREA.

- ☐ YES: → Where was that? ____________________
  - ☐ GREATER VANCOUVER (specify municipaltiy ____________________)
  - ☐ OTHER BC LOCATION (specify SEA TO SKY CORRIDOR ____________ OTHER BC ____________)
  - ☐ OTHER USA (not home state) __________
  - ☐ OTHER COUNTRY (not home country) __________
- ☐ NO → GO TO Q3f

3e) IF GREATER VANCOUVER/OTHER BC: What type of accommodation did you have there [IN Q3d] ?

- ☐ Hotel, motel
- ☐ Bed & breakfast
- ☐ Private residence (friend/family)
- ☐ Other SPECIFY ________

3f) What mode of transportation did you use to travel to BC (from your home)?

- ☐ Airplane
- ☐ Bus → Was that: ☐ a scheduled bus service, → ☐ Greyhound or ☐ Other__________?
  - ☐ a tour bus service or
  - ☐ a specially chartered bus?
  - ☐ OTHER __________
- ☐ Cruise ship
- ☐ Ferry (from Seattle)
- ☐ Train
- ☐ Private vehicle→ Were you: ☐ driver or ☐ passenger? ☐ BOTH
- ☐ **Rented vehicle→ Were you: ☐ driver or ☐ passenger? ☐ BOTH**
- ☐ Other SPECIFY __________

3g) And what mode(s) of transportation did you use to travel to Whistler specifically?

- ☐ **Private vehicle**→ Were you: ☐ driver or ☐ passenger? ☐ BOTH
- ☐ Rented vehicle→ **Were you: ☐ driver or ☐ passenger? ☐ BOTH**
- ☐ **Bus** → Was that:
  - ☐ a scheduled bus service → Greyhound or Other?
  - ☐ a tour bus service or
  - ☐ a specially chartered bus?
  - ☐ OTHER __________
- ☐ **Train** → Was that the:
  - ☐ Cariboo Prospector
  - ☐ Royal Hudson
- ☐ **Other** SPECIFY __________

3h) IF MULTIPLE TRIPS TO WHISTLER (Q1=NO), ASK: Did you use any other modes of transportation on previous trips to Whistler? If so, which modes? ____________________

3i) Now that you've been to Whistler, would you consider any other modes of transportation in the future?
☐ YES ☐ NO ☐ DON'T KNOW

4a) You mentioned using [INSERT ANSWER TO Q3g__________] on this trip to Whistler. When you were deciding on this mode of transportation, how much influence did the following factors have in your decision? HAND CARD. Please use this scale of 1 to 5, where 5 = extremely influential and 1 = not at all influential. Starting with _______, how much influence did this have on your decision? ROTATE ORDER

WRITE IN IF "NA = NOT APPLICABLE" OR "DK = DON'T KNOW".

___Arriving and departing when you want
___Advice of travel agent
___Number of transfers to reach your destination
___Ease of luggage handling and storage
___Cost of transportation

4b) And is there anything I have NOT mentioned that had a significant influence on your decision to choose this mode of transportation over other modes available? What would that be? PROBE FOR SPECIFICS

____

____

☐ *NO/NOTHING ELSE*

5a) Do you plan to stop for an overnight visit at any other destinations in BC?

☐ NO
☐ YES → **Where in BC?** ____
- ☐ **Squamish BC** (including Brackendale, Garibaldi Highlands)
- ☐ **Any other place along the Sea to Sky Corridor – between Lion's Bay and Whistler, including parks and recreation sites along the way** (INCLUDE: Lion's Bay, Porteau Cove, Britannia Beach, Furry Creek, parks/recreation sites along the way) SPECIFY:______________________________
- ☐ **Greater Vancouver destinations → PROBE:** Which Greater Vancouver municipality? READ IF NECESSARY.
  ____
  - ☐ **The North Shore** (INCL. Horseshoe Bay, West Vancouver, North Vancouver)
  - ☐ **City of Vancouver, Burnaby or New Westminster**
  - ☐ **Other Greater Vancouver north of the Fraser River** (INCL. Port Moody, Coquitlam, Port Coquitlam, Maple Ridge, Pitt Meadows, Haney)
  - ☐ **Other Greater Vancouver south of the Fraser River** (INCL. Vancouver International Airport, Richmond, Surrey, Langely/Ft. Langley, Delta/ Ladner/Tsawwassen, White Rock)
  - ☐ Other specify ______________________________ (RE-CODE ABOVE)
- ☐ **Victoria**
- ☐ **Other Vancouver Island**
- ☐ **OTHER BC** ______________________________

5b) How many nights in total will you spend in BC on this trip? # _______

Q6-8: CONCEPT TESTING SECTION

READ TO ALL RESPONDENTS: Now, I'd like to tell you about some possible changes that transportation planners are studying for travel along the Sea to Sky Corridor, that is the region from Horseshoe Bay, just north of Greater Vancouver, all the way up to Whistler. ***ROTATE OPTIONS. RECORD ORDER OF PRESENTATION.***

Here is one/another possible transportation change ...

ROTATION _____

(EXPANDED HIGHWAY OPTION) The **Sea-to-Sky highway would be expanded** to 4 lanes between Horseshoe Bay (just north of Greater Vancouver) and Squamish, which is about half-way between Vancouver and Whistler. The portion of highway from Squamish to Whistler would remain 2 lanes, but there would be road safety and spot improvements along the route.

One transportation choice on the expanded highway would be to travel by **private or rented vehicle**. Highway travel time from Downtown Vancouver would average about one and three-quarter hours to Whistler. Cost of gas averages about $16 one-way.

6. If an expanded highway had been available, how likely would you have been to use a private or rented vehicle for this trip to Whistler? ***Would you say:***

☐ definitely, *☐ probably,* *☐ might or might not,* *☐ probably not or* *☐ definitely not?*
☐ DON'T KNOW

ROTATION_____

SPLIT CELLS: HALF HEAR Cell 1 AND HALF Cell 2 → CHECK OPTION READ:

☐ ***(RAIL CELL 1)***. BC Rail **train** service would run between North Vancouver, Squamish and Whistler with comfortable, up-to-date passenger cars. The frequency of trains would increase to 3 trains per day in each direction. The adult fare from North Vancouver would be $50 one-way to Whistler. Total travel time from the North Vancouver train station would be about about 3 hours to Whistler, including wait and boarding time... To get to the North Vancouver train station from Downtown Vancouver would take approximately 20 minutes by SeaBus or 30 minutes by private vehicle. Note that the train station would be re-located to be close to SeaBus, regional bus connections and a parking facility.

OR

☐ ***(RAIL CELL2)*** BC Rail **train** service would run between North Vancouver, Squamish and Whistler with comfortable, up-to-date passenger cars plus improvements to the track. The frequency of trains would increase to 3 trains per day in each direction. The adult fare from North Vancouver would be $70 one-way to Whistler. Total travel time from the North Vancouver train station would be about two and three-quarter hours to Whistler, including wait and boarding time. ... To get to the North Vancouver train station from Downtown Vancouver would take approximately 20 minutes by SeaBus or 30 minutes by private vehicle. Note that the train station would be re-located to be close to SeaBus, regional bus connections and a parking facility.

7. If this train service had been available, how likely would you have been to take the train on this trip to Whistler? ***Would you say:***

☐ definitely, *☐ probably,* *☐ might or might not,* *☐ probably not or* *☐ definitely not?*
☐ DON'T KNOW

ROTATION____

(FERRY OPTION) A **passenger-only ferry** service would operate between Downtown Vancouver and Squamish. In Squamish there would be bus connections to Whistler. The passenger-only ferry service would run 4 times per day in each direction. Total travel time from Downtown Vancouver by ferry to Squamish would be about one hour, including wait and boarding time. Total travel time all the way to Whistler would average two and three-quarter hours, including wait, boarding, transfer and travel times for the ferry and bus service. The cost would be $35 one-way for ferry-bus service to Whistler.

8. If this service had been available, how likely would you have been to take the passenger-only ferry on this trip to Whistler? ***Would you say:***

☐ definitely, *☐ probably,* *☐ might or might not,* *☐ probably not or* *☐ definitely not?*
☐ DON'T KNOW

DEMOGRAPHICS SECTION

Finally, a few questions to help us make sure our sample represents all groups of the population.

i. Do you own property or time-sharing accommodation in the Whistler area or anywhere along the Sea to Sky Corridor?

☐ NO
☐ YES: → PROBE: If so, where? DO NOT READ. Any other?
    ☐ WHISTLER
    ☐ SQUAMISH (including BRACKENDALE, GARIBALDI HIGHLANDS)
    ☐ PEMBERTON
    ☐ OTHER SEA TO SKY CORRIDOR ((INCLUDE: LION'S BAY, PORTEAU COVE, BRITANNIA BEACH, FURRY CREEK, PEMBERTON, OTHER LOCATIONS ALONG THE WAY)

ii. Including yourself, how many people reside in your household? ____

iii. NOT IN THIS VERSION

iv. Into which of the following age groups can I place you?

☐ 16-24 years
☐ 25-34 years
☐ 35-44 years
☐ 45-54 years
☐ 55-64 years
☐ 65 years and over

v. Into which of the following broad income groupings does your annual household income, before taxes, fall?

☐ Under $50,000
    ☐ Under $30,000
    ☐ $30,000 to $50,000
☐ $50,000 or more
    ☐ $50,000 to 75,000
    ☐ $75,000 to 100,000
    ☐ $100,000 or more
☐ DON'T KNOW
☐ REFUSED

vi. If follow-up research were to be conducted sometime in the next year on this or related topics, would you be interested in participating?

☐ YES → May I please have your name and home phone number and/or email address? (RECORD BELOW)
☐ NO ☐ DON'T KNOW

In case my supervisor needs to verify that I completed this survey, may I please have your first name or initial.

Mr./Ms: ____
and your home phone number please: (AREA CODE) ______ - ______ - _________
or email address: ______________________________

Thank you very much for participating in our survey; we appreciate your input. Have a pleasant day/evening.

Appendix B

Vancouver Whistler Inter-City Bus Demand

Technical Appendix B

Vancouver Whistler Inter-City Bus Demand

Prepared by:

Mobility Solutions

and

TSi Consultants

December 2001

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1. Introduction

Whistler is one of the most successful ski and resort facilities in North America. As such its winter population can swell by an additional 20,000 people during the peak periods such as Christmas/New Years and the March school break and in mid-season. The resort is also successfully building its reputation as a summertime venue because of a variety of biking and hiking opportunities, three golf courses in the immediate vicinity and first-rate resort facilities.

As Whistler is situated 140 kilometers north of Vancouver and the Vancouver International Airport, significant inter-city travel is generated between these communities. Less than one percent of this travel is accommodated by the rail and air modes. As such most visitors make use of the Sea-to-Sky Highway 99 North.

This report focuses on the use of inter-city buses in the corridor. The study objectives are to determine the following:

- ❑ the proportion of resident versus visitor (non-resident) bus demand
- ❑ annual inter-city bus trips and ridership
- ❑ variables to consider in forecasting future bus passenger growth

The report is organized as follows:

- ❑ Survey Design and Conduct
    - ⇒ explains the bus survey methodology
    - ⇒ explains the validity of the survey response
- ❑ Survey Analysis
    - ⇒ develops estimates of annual ridership
    - ⇒ discusses origins and destinations of trips
    - ⇒ presents considerations for growth in the corridor
- ❑ Conclusions

2. Survey Design and Conduct

This section provides an overview of the bus survey design and conduct. In order to calculate the number of bus passengers in the Vancouver-Whistler corridor, it is necessary to understand sub-components of this demand. It is hypothesized that there are two important dimensions:

- ☐ the seasonal nature of demand to the Whistler resort
- ☐ the nature of the inter-city bus business

Accordingly, these dimensions are explained below.

2.1 Seasonal Bus Demand

Travel demand in this corridor varies by season, especially for tourist traffic. There are essentially three seasons:

- ☐ winter ski season (Nov 24-Mar 31)
- ☐ summer season (Apr 1 – Sept 30)
- ☐ off-season (Oct 1 – Nov 23)

It is speculated that the winter season for the charter business comprises primarily of delivering visitors from the airport and downtown hotels to hotels in Whistler. The summer season may consist of day and circle tours that pass through Whistler. The off-season is an especially quiet time for the industry.

2.2 Inter-City Bus Business

The inter-city bus business can similarly be broken down into two main elements:

- ☐ charter business
- ☐ scheduled service

Charter service caters primarily to visitors to the region from a variety of world origins. Through trips from Vancouver to Whistler are typical – some for the day, some for multi-day visits to Whistler for conferences, skiing etc. and some which carry through the Whistler region onward on circle tours of the province.

Scheduled service primarily serves residents of the region catering to the normal and repeatable travel purposes of the resident population. These include trips for work and weekend recreation, etc.

While the above descriptions offer "generalized" use of the respective services, they are by no means exclusive. Tourists who are sufficiently familiar with the region can use scheduled services as well as longer bus journeys originating in the United States or Vancouver Island. Similarly, residents make use of charter services for school and sports club outings - a use that is by no means insignificant.

Charter Service

The Motor Carrier Commission (MCC) is responsible for regulating the inter-city bus industry in the province. In the case of the charter services, specific areas of operation can be identified. Some buses operate exclusively in the Whistler-Vancouver corridor with specified home bases. Other services can operate throughout British Columbia with some of their services operating in the corridor "upon request".

Scheduled Services

There are two main actors providing scheduled services between Whistler and Vancouver:

- ☐ Greyhound
- ☐ Perimeter

The schedules of each are shown in Attachments 1 and 2.

The Greyhound service originates at the main bus terminal at Station and Main with connections to the United States and points to the east in Canada. The Perimeter service originates at the airport.

2.3 Survey Design

Given the absolute regulatory control of the MCC, it was decided to begin by defining the population of buses with their records as described below.

Survey Universe

The MCC issues "certificates" which can be thought of as license plates for all vehicles of varying sizes carrying passengers in the Province. Although it is possible for a company to have more vehicles than certificates, no more vehicles than the number of certificates issued can operate on public highways at one time. There are three areas of operations relevant for the Sea-to-Sky corridor:

- ☐ Vancouver-Whistler corridor with base in Vancouver
- ☐ Vancouver-Whistler corridor with base in Whistler
- ☐ Provincial scope

For the purpose of this study, companies in the first two groups were identified. A total of 2 scheduled services and 35 charter services were defined. A total of 254 certificates define the total population of charter buses that are eligible to operate in the corridor.

Requested Information

The requirement of this study was to obtain the following general information:

- ☐ The capacity of equipment used
- ☐ Passenger volumes by season
- ☐ Revenue vs. deadheading trips

- ☐ Origins within Vancouver
- ☐ Destinations within Whistler
- ☐ Company comments regarding the prospects for growth and additional service the government could provide

It is important to note that the bus industry is extremely competitive. Therefore, a promise of confidentiality was essential in collecting any information relating to specifics of the business. In balancing these needs, the survey form shown in Attachment 3 was devised. The survey was administered by phone in order to achieve a rapid response. The option of faxing this form was given for those who preferred to refer to their records.

2.4 Survey Conduct

The survey was administered in early October 2001. The following discussion focuses on the charter services.

Charter Bus Survey
It was found that generally smaller firms were quite willing to co-operate on the phone. Larger firms were more reluctant to co-operate which is understandable because of the larger databases involved. These companies were invited to do the fax-back method. Exhibit 2.1 summarizes the charter company survey results:

Exhibit 2.1 – Charter Bus Survey Responses

MCC Population		Survey Responses				
		Companies			Certificates	
Companies	Certificates	Contacted	Responses	Percent	Number	Percent
35	254	13	9	25.7%	170	66.9%

Note: includes only companies licensed specifically for Sea-to-Sky corridor

Contact with a total of 13 companies from MCC records was attempted. Of these, one contact could not be established by any means. Of the twelve remaining firms, eight chose to co-operate. Of those, one firm had been taken over by another. The bus fleet for the merged firm was similar to the sum from MCC records. Because the companies with the largest fleets were selected, a total of 170 vehicles were surveyed (represents two-thirds of the total fleet).

Additionally a data check of the distribution of vehicle capacities and the total number of certificates reported against those on record at the MCC was also made. This data is illustrated in Exhibit 2.2.

Exhibit 2.2 – Comparison of MCC Certificates and Reported Equipment

MCC Certificates		Surveyed Equipment				
Companies	Certificates	Vans	Sm Buses	Lrg Buses	Total	Percent
8	170	33	34	85	152	89.4%

There are no control totals by vehicle capacity; however, all vehicle classes are well represented. Note that companies are reporting only ninety percent of the registered vehicles in the MCC records. This may be explained by a time lag from registration, the slow fall season in which the survey was conducted in which some vehicles may be withdrawn from service, or that some of the firm's equipment never operates in the Vancouver-Whistler corridor. This last reason is felt to be the more significant. It was therefore decided to reduce the population size by this amount before expansion.

Scheduled Bus Survey

A similar survey was conducted for scheduled services. However, due to the small number of firms involved and confidentiality agreements the design and conduct of this survey is not presented. Data collected from this survey is presented in Section 3.

3. Survey Analysis

This section provides an overview of the survey data expansion and resulting estimates of bus movements and ridership by type of service and season. An estimate and range are developed for annual inter-city bus trips and passengers. Additional information on bus origins and destinations and prospects for future growth are presented.

3.1 Charter Bus Service

This section describes the trip-making characteristics of the charter companies that responded to the survey. Most operators reported for the current year although some 2000 results are included. There appeared to be three types of trips occurring with buses through the full capacity range:

- ☐ Day trips to Whistler
- ☐ Transfer to Whistler hotels
- ☐ Overnight one-way trips (Circle tours which pass through Whistler in the northbound direction)

In the case of day-trips to Whistler the bus may deadhead back to do other work during the day. These results are described below according to the three seasons.

Unexpanded Charter Bus Survey Results

The winter season occurs between November 24th and March 31st. Exhibit 3.1 shows the winter statistics for the surveyed charter companies.

Exhibit 3.1 – Winter Charter Bus Trips and Ridership (unexpanded survey)

Direction	Revenue Trips	DeadHead Trips	Total Trips	Bus Passengers
N/B	3,593	425	4,018	58,390
S/B	3,671	345	4,016	58,165
Total	7,264	771	8,035	116,555

This exhibit demonstrates the significance of the inter-city bus market. Winter is the busiest season due to the attraction of Whistler/Blackcomb skiing. Northbound and southbound bus movements are evenly split and deadheading accounts for approximately 10 percent of the trips. While there may be some error related to the deadhead estimate, it nevertheless indicates that equipment is utilized very efficiently.

The summer season is defined as beginning April 1st and ending September 30th. Exhibit 3.2 shows the information for the summer season.

Exhibit 3.2 – Summer Charter Bus Trips and Ridership (unexpanded survey)

Direction	Revenue Trips	DeadHead Trips	Total Trips	Bus Passengers
N/B	1,742	169	1,911	34,544
S/B	1,592	169	1,761	31,654
Total	3,334	338	3,672	66,198

Summer travel is approximately half of the winter season. Slightly more passenger trips are northbound which indicates that "circle" tours depart northbound in a clockwise direction. Deadheading is again reported at about 10 percent.

The off-season (October 1st to November 23rd) information is shown in Exhibit 3.3.

Exhibit 3.3 – Off-Season Charter Bus Trips and Ridership (unexpanded survey)

Direction	Revenue Trips	DeadHead Trips	Total Trips	Bus Passengers
N/B	142	10	152	1,807
S/B	142	10	152	1,807
Total	284	20	304	3,614

Compared to other seasons, the off-season represents a small fraction of total trip making.

Summing the seasons, the total trip making represented in the surveys is shown in Exhibit 3.4.

Exhibit 3.4 – Annual Charter Bus Trips and Ridership (unexpanded survey)

Direction	Revenue Trips	DeadHead Trips	Total Trips	Bus Passengers
N/B	5,477	604	6,081	94,740
S/B	5,405	524	5,929	91,626
Total	10,882	1,129	12,011	186,366

Expansion Factors

As discussed previously, it was found that the amount of equipment employed in the corridor was slightly less than indicated by MCC records. As a result, it was decided to reduce the population figure as follows:

Revised Population = .894 x MCC Populations

= .894 x 254 = 227 vehicles

Since the survey recorded the data for 152 vehicles the expansion factor is calculated as:

Expansion Factor = 227/152 = 1.493

There may be some bias in applying the expansion factor directly to cover the mostly smaller firms that were not contacted. For example, the distribution of vehicle capacities may not be similar to that observed. However, the fact that the vehicle capacity distribution reported in Exhibit 2.2 is broad and the smaller firms surveyed owned exclusively larger vehicles gives some confidence in applying the global expansion factor.

Expanded Charter Bus Survey Results

Applying the above expansion factors, a picture of total annual charter bus ridership is determined as illustrated in the following series of exhibits.

Exhibit 3.5 – Winter Charter Bus Trips and Ridership (expanded survey)

Direction	Revenue Trips	DeadHead Trips	Total Trips	Bus Passengers
N/B	5,360	630	5,990	87,180
S/B	5,480	520	6,000	86,840
Total	10,840	1,150	11,990	174,020

Exhibit 3.6 – Summer Charter Bus Trips and Ridership (expanded survey)

Direction	Revenue Trips	DeadHead Trips	Total Trips	Bus Passengers
N/B	2,600	250	2,850	51,570
S/B	2,380	250	2,630	47,260
Total	4,980	500	5,480	98,830

Exhibit 3.7 – Off-Season Charter Bus Trips and Ridership (expanded survey)

Direction	Revenue Trips	DeadHead Trips	Total Trips	Bus Passengers
N/B	210	10	220	2,700
S/B	210	10	220	2,700
Total	420	20	440	5,400

Exhibit 3.8 – Annual Charter Bus Trips and Ridership (expanded survey)

Direction	Revenue Trips	DeadHead Trips	Total Trips	Bus Passengers
N/B	8,170	890	9,060	141,450
S/B	8,070	780	8,850	136,800
Total	16,240	1,670	17,910	278,250

Therefore, more than a quarter of a million bus passengers used these services in the last year.

3.2 "Upon Request" and Other Charter Bus Service

In addition to the services identified by the MCC operating specifically in the corridor, there are 38 additional unnamed companies with 446 certificates that can carry passengers to Whistler on a request basis. Moreover, there are 851 additional companies accounting for 5,445 certificates operating under general "intra-provincial" and "extra provincial" licenses that can similarly serve Whistler as a destination from time to time.

An attempt to interview some of these was done by contacting bus companies listed in the phone book that had not been named in the MCC records or known to operate in the corridor "upon request" as identified by named companies.

Generally, it appears that these companies do not make as many trips as the companies licensed specifically to serve the corridor. However, because there are so many certificates, their cumulative effect is significant. It also appears that these "unnamed" companies have a bias towards larger buses.

Based on a limited number of interviews with these companies, seasonal expansion factors were developed for application to the expanded charter bus survey:

Winter	0.45
Summer	0.40
Shoulder	0.10

The annual ridership for "upon request" and other bus services are shown in Exhibit 3.9.

Exhibit 3.9 – Annual Estimate of Upon Request and Other Bus Trips and Ridership

Direction	Revenue Trips	DeadHead Trips	Total Trips	Bus Passengers
N/B	3,470	380	3,850	60,130
S/B	3,440	330	3,770	58,250
Total	6,910	710	7,620	118,380

3.3 Scheduled Bus Service

Using a similar process applied to a much more targeted population, it was possible to develop estimates for annual ridership on scheduled services as shown in the following exhibit.

Exhibit 3.10 – Annual Scheduled Bus Trips and Ridership

Direction	Revenue Trips	DeadHead Trips	Total Trips	Bus Passengers
N/B	6,720	60	6,780	148,350
S/B	6,720	60	6,780	148,010
Total	13,440	120	13,560	296,360

It is important to note that the winter season accounts for more than 50 percent of the demand, but only one-third of the bus movements. Therefore, average occupancies in the winter months are more than 30 passengers per bus or approximately double the summer bus occupancies.

3.4 Total Bus Ridership

Based on the information developed in the previous sections, it is possible to develop an estimate of total annual inter-city bus trips and ridership. Exhibit 3.11 shows the total revenue trips, deadhead trips and bus passengers for charter, upon request and scheduled service.

Exhibit 3.11 – Annual Total Bus Trips and Ridership

Direction	Revenue Trips	DeadHead Trips	Total Trips	Bus Passengers
N/B	18,360	1,330	19,690	349,930
S/B	18,230	1,170	19,400	343,060
Total	36,590	2,500	39,090	692,990

In total there are almost forty thousand annual bus movements and approximately 700,000 bus passengers using the corridor. These numbers are evenly split by direction. Charter and upon request service represents approximately 65 percent of the bus movements and 57 percent of the passengers.

Exhibit 3.12 provides a breakdown of the bus movements and ridership by season.

Exhibit 3.12 – Seasonal Composition of Bus Trips and Ridership

	Seasonal Totals		Average Daily		
	Total Trips	Bus Passengers	Total Daily Trips	Bus Passengers	Avg Occ.
Winter	22,210	403,190	170	3,130	18.4
Summer	14,480	244,120	80	1,340	16.8
Off-Season	2,390	45,680	40	850	21.3
Annual	39,080	692,990	110	1,900	17.3

The winter season, which spans approximately 4.5 months, accounts for approximately 60 percent of the annual trips and bus passengers. Converting these figures to daily estimates shows that on an average day there are approximately 110 bus movements and 1,900 passengers using the corridor. Note however, these figures vary dramatically by season. Winter bus movements are more than double the summer season, which in turn are double the off-season. Similar trends are observed for bus passengers.

3.5 Sensitivity

There is undoubtedly error in the above estimate. Many owners participated in this survey over the phone without reference to records to facilitate a quick response. Indeed, although records of bus departures are more certain, the extent of deadheading and actual ridership data is simply not available in many cases. In this situation, it was felt that owners might be tending to over-estimate their ridership estimates in particular.

Even more significant however, is the lack information on the "upon request" population of buses that appear to be doing significant work in the corridor.

Finally, there is an absence of consistent ground count data in the corridor. A program of counting would significantly reduce much of this uncertainty. Such a program should identify the following:

- ☐ Bus companies
- ☐ Distribution of size of equipment
- ☐ Occupancies
- ☐ Day of week and seasonal variation

Until such a count program can be established, it is recommended that total passengers in Exhibit 3.11 be interpreted as close to a maximum of 700,000. A minimum figure would be 625,000 as defined by a minimum set of ground counts now available.

3.6 Trip Origins and Destinations

In addition to trip and passenger information, charter companies were asked to provide information on passenger pick-up locations in Vancouver and drop-off locations in Whistler. In some cases multiple stops were made; for example, stops at both the airport and hotels were a common combination. Exhibit 3.13 shows the distribution of origin and destination locations by type of land use.

Exhibit 3.13 – Charter Bus Origins and Destinations

Vancouver Origins		Whistler Destinations	
Locations	Percent	Locations	Percent
Airport	27%	Hotels	44%
Hotels	47%	Ski Base	56%
United States	4%		
Schools/Malls	21%		
Vancouver Island	1%		

The majority of bus passengers are picked-up at hotels, the airport, schools and shopping malls. Note that approximately 5 percent of the bus trips originate outside of the Lower Mainland.

Trip destinations are more concentrated and are distributed between hotels and the ski lift area. It should be noted that a small portion of "hotel" destinations are in fact destined to the "youth hostel".

3.7 Growth Prospects, Marketing and Modelling Considerations

Bus companies provided limited information on annual growth. One respondent indicated a year over year growth rate of 35 percent from the summer season in 1999 compared with 2000. It is felt that this is an optimistic growth rate to apply over longer future time periods. For example, information on visits from Tourism Whistler shows that there was no growth over this period. However, inter-city bus travel may be making increases in modal share or the proportion of non-local summer visitors may be increasing in Whistler.

It was unfortunate that this survey was administered in the wake of the events of September 11th. Several operators commented on an immediate decline in business. To the extent that many bus patrons arrive in the region by air (see Exhibit 3.13), the growth rate to establish 2001 business will certainly be lower. On the other hand, this unfortunate event occurred just as the lowest season was about to begin. Other operators saw no long-term implications and expected that by the time that the high winter season begins there will be little effect.

In terms of marketing, it appears that the bus industry contracts their capacity out to wholesale tour operators. These entities in turn provide the publicity to individual tour agencies that solicit customers. Sometimes direct relationships develop with agencies. Some charter companies specialize in certain segments of the market like budget travel or customers originating from a particular part of the world like Asia or Latin America. An interesting new development in this respect is the use of the Internet. In this way charter bus companies are forging direct links with their customers. This may be a sustainable trend that will backstop strong growth rates in tourism.

In terms of predicting future trips, it is suggested that special independent variables be considered in forecasting the generation of inter-city bus passengers. Certainly traditional variables such as the respective populations and employment of the respective regions should be considered to describe the strong scheduled service ridership and that component of charter service that is locally supported.

However, because of the tourist nature of many of these trips, independent variables relating to this industry must be selected. In terms of origins the following should be considered to forecast inter-city bus travel in the corridor:

- ☐ YVR annual arrivals and departures
- ☐ A measure of downtown Vancouver hotel occupancy and total rooms

In terms of destinations, the following measures of activity at Whistler could be considered:

- ☐ Whistler accommodation room nights
- ☐ Total Whistler visitors or skier visits
- ☐ Value of Whistler development (or bed units)

Operators themselves are very confident in the long-term prospects for the industry moving beyond the short-term concerns generated by the events of September 11th. Indeed many offered very aggressive growth prospects and other asked for restrictive measures to be applied to solo drivers on Highway 99 so that the bus industry could capture greater modal share.

4. Conclusions

The primary objective of the bus demand survey was to develop an annual estimate of bus movements and passengers using the Sea-to-Sky corridor. Additionally, other information such as seasonal variation, type of service, origin and destination locations and potential for future growth was obtained.

The following summarizes some of the key findings:

- Inter-city bus travel along the Sea-to-Sky corridor is comprised of approximately 40,000 annual vehicle movements and close to 700,000 bus passengers in 2000/2001.
- There are approximately 110 average daily bus movements in the corridor carrying approximately 1,900 passengers. Note that this varies dramatically by season. Average daily winter volumes and passengers are approximately double the summer season, which in turn are twice that of the off-season.
- The winter ski season (22 weeks) generates 65 percent more total ridership than the summer season (26 weeks), although anecdotal information indicates that the gap is narrowing.
- The business is shared by scheduled and charter services almost equally.
- Tourism or non-residents represent the single largest driver of this market.
- Charter services cater to tourism but there is an important local market, especially for summer day trips.
- Scheduled services cater to the local population but many tourists use it also, as feeder services provide connections from the United States, Vancouver Island and points east.
- Independent variables that describe tourism industry will best describe the increase in inter-city bus patronage.
- The industry is cautiously optimistic about growth in the near-term and very optimistic in the longer term; indeed, through restrictive policies aimed to discourage private vehicles, they are interested in capturing a greater modal share in the corridor.

Attachment 1 – Greyhound Schedule

Greyhound Schedule

Northbound

Vancouver		8:00	11:00	**1:00**	**3:00**	**5:00**	**7:00**	6:30
West Vancouver (Bus Shelter)		8:15	11:15	**1:15**	**3:15**	**5:15**	**7:15**	6:45
Horseshoe Bay		8:30	11:30	**1:30**	**3:30**	**5:30**	**7:30**	7:00
Lions Bay		8:40	11:40	**1:40**	H.St.	**5:40**	**7:40**	*E*
Brittania Beach		8:55	11:55	**1:55**	H.St.	**5:55**	**7:55**	*X*
Squamish	7:05	9:10	**12:15**	**2:15**	H.St.	**6:15**	**8:15**	*P*
Dentville	7:10	-	-	-	-	-	**8:20**	*R*
Garibaldi Highlands (Depot)	7:30	9:40	**12:40**	**2:40**	H.St.	**6:40**	**8:40**	*E*
Brackendale	7:35	9:45	**12:45**	**2:45**	-	**6:45**	**8:45**	*S*
Pinecrest/Black Tusk	7:55	10:05	**1:05**	**3:05**	**4:50**	**7:05**	**9:05**	*S*
Whistler Creek	8:10	10:20	**1:20**	**3:20**	**5:05**	**7:20**	**9:20**	8:20
Whistler Village	8:15	10:30	**1:30**	**3:30**	**5:15**	**7:30**	**9:30**	8:30
Village North		10:35		**3:35**	**5:20**		**9:35**	
Emerald Estates		10:50		**3:50**	**5:30**		**9:45**	
Ar. **Pemberton**		11:10		**4:10**	**6:00**		**10:10**	
Lv. **Pemberton**				**5:50**				
Mt. Currie (General Store)				**6:00**			**Req.**	

H.St. - Highway Stop (Does not go into town)

Req. - On Request Only

Southbound

Mt. Currie (General Store)		7:10				**6:00**		
Ar. **Pemberton**		7:20				**6:10**		
Lv. **Pemberton**	4:45	7:30		**12:30**		**6:20**		
Emerald Estates	5:05	7:50		**12:55**		**6:40**		
Village North	5:10	8:05		**1:00**		**6:55**		
Whistler Village	5:30	8:30	10:30	**1:30**	**4:45**	**7:30**	**8:25**	**4:30**
Whistler Creek	5:35	8:35	10:35	**1:35**	**4:50**	**7:40**	**8:30**	**4:35**
Pinecrest/Black Tusk	5:45	8:52	10:52	**1:52**	**5:07**	**8:02**	**8:47**	*E*
Brackendale	6:05	9:10	11:10	**2:10**	**5:25**	**8:10**	**8:55**	*X*
Garibaldi Highlands (Depot)	6:20	9:35	11:35	**2:35**	**5:45**	**8:35**	**9:20**	*P*
Dentville	6:25	9:40	-	-	**5:50**	-	**9:25**	*R*
Squamish	6:30	9:45	11:45	**2:45**	**5:55**	**8:45**	**Req.**	*E*
Brittania Beach	6:45	10:00	**12:00**	**3:00**	**6:10**	**9:00**		*S*
Lions Bay	7:00	10:15	**12:15**	**3:15**	**6:25**	**9:15**		*S*
Horseshoe Bay	7:15	10:35	**12:35**	**3:35**	**6:40**	**9:25**		**5:45**
Park Royal (West Vancouver)	7:25	10:45	**12:45**	**3:45**	**6:50**	**9:40**		**6:00**
Vancouver	8:00	11:15	**1:15**	**4:15**	**7:20**	**10:00**		**6:30**

Req. - On Request Only

P.M. - Bold Face Figures

A.M. - Light Face Figures

Attachment 2 – Perimeter Schedule

Perimeter Bus Service

			Southbound		
Airport to Whistler			**Whistler to Airport**		
Departs Vancouver Airport		Arrives Whistler Gateway	Departs Whistler Gateway		Arrives Vancouver Airport
09:30	vh	12:30	05:00	exp	7:30
11:30	vh	14:30	07:00	vh*	9:30
13:30	vh	16:30	09:00	vh	12:00
15:30	vh	18:30	11:00	vh	14:00
17:30	vh*	20:00	13:00	vh	16:00
19:30	vh**	22:00	15:00	vh	18:00
21:30	exp	Midnight	18:00	vh	21:00
** 09:30, 11:30, 13:30, 15:30 NB Departures stop at Shannon Falls 10 min (May 15 - Oct 15)*					
07:30	wh	10:30	*Additional summer departures in effect*		
23:30	exp	2:00	*Only Nov21/01 to Dec14/01*		

Attachment 3 – Bus Survey Form

SEA TO SKY BUS DEMAND PROFILE SURVEY

Company Name ______________________________

Contact Name ______________________________

Fax No: ______-______-________

On behalf of the Ministry of Transportation, Resort Municipality of Whistler, BC Rail, West Coast Express and TransLink, TSi Consultants has been retained to examine the long-term travel requirements along the Sea to Sky corridor. A significant component of travel in the corridor is related to charter and tour bus operations. **Please help us gain a better understanding of bus travel demand by completing this survey. The information you provide will ensure that the requirements and concerns of the bus industry are addressed.**

YOUR RESPONSES WILL BE TREATED IN THE STRICTEST OF CONFIDENCE.

1. Could you describe the number of Buses or Other Vehicles licensed to operate in the Whistler/Vancouver corridor?

	Number	Seating Capacity
Mini-Vans	_____	_____
Buses	_____	_____
Buses	_____	_____
Buses	_____	_____
Other	_____	_____

2. In the past summer, winter and shoulder periods, please indicate below, your total or average daily (weekday and weekend) number of one-way trips and passenger loadings:

Summer Season (April 1st to Sept 30th, 2001)

	Total Summer Trips		
	Loaded		Empty (deadhead)
Direction	# of Trips	Total Pass	# of Trips
NB			
SB			
Total			

OR ->

Average Summer Weekday			Average Summer Weekend		
Loaded		Empty (deadhead)	Loaded		Empty (deadhead)
# of Trips	Avg. # of Pass.	# of Trips	# of Trips	Avg. # of Pass.	# of Trips

Winter Season (Nov 24th, 2000 to March 31st, 2001)

	Total Winter Trips		
	Loaded		Empty (deadhead)
Direction	# of Trips	Total Pass	# of Trips
NB			
SB			
Total			

OR ->

Average Winter Weekday			Average Winter Weekend		
Loaded		Empty (deadhead)	Loaded		Empty (deadhead)
# of Trips	Avg. # of Pass.	# of Trips	# of Trips	Avg. # of Pass.	# of Trips

Shoulder Season (Oct 1st to Nov 23rd, 2000)

	Total Summer Trips		
	Loaded		Empty (deadhead)
Direction	# of Trips	Total Pass	# of Trips
NB			
SB			
Total			

OR ->

Average Shoulder Weekday			Average Shoulder Weekend		
Loaded		Empty (deadhead)	Loaded		Empty (deadhead)
# of Trips	Avg. # of Pass.	# of Trips	# of Trips	Avg. # of Pass.	# of Trips

5. Could you provide information on previous summer and winter seasons as well? If yes, please copy this page and repeat for 1999/2000, 1998/1999 etc., if possible.

6. Typically, where do you collect your passengers (OR drop passengers if originating in Whistler or somewhere along the corridor)?

	Percentage
Vancouver hotels	_____
Vancouver businesses/shopping centres	_____
Vancouver homes	_____
Outside Vancouver in BC	_____
United States	_____
Other Location(s) Describe:	

____

7. Typically, where do you take passengers in Whistler or along the corridor (OR pickup if originating in Whistler along the corridor)?

	Percentage
Whistler Hotels	_____
Whistler Convention Centre	_____
Whistler Ski Base (skiing, hiking)	_____
Squamish	_____
Provincial Parks	_____
Beyond Whistler	_____
Other Describe:	

____

8. As you see it, what are the greatest factors contributing to the growth of your business in the corridor?

____

____

____

9. Any other comments that would help you prepare for the 2010 Olympics?

____

____

____

PLEASE FAX COMPLETED SURVEY BACK TO 604-293-2892.

THANK YOU FOR YOUR CONTRIBUTION. If you have any further questions or suggestions, please contact Robert Hodgins at 604-721-3457.

Appendix C

A Methodology for Population Distribution in the Sea-to-Sky Corridor

A METHODOLOGY FOR POPULATION DISTRIBUTION IN THE SEA TO SKY CORRIDOR

URBAN FUTURES
INCORPORATED

Suite 212 - 515 West Pender Street Vancouver Canada V6B 6H5
tel: 604.682.8323 *fax:* 604.682.8388 *email:* mail@urbanfutures.com *www:* urbanfutures.com

A METHODOLOGY FOR POPULATION DISTRIBUTION IN THE SEA TO SKY CORRIDOR

Prepared for:

TSi Consultants

November 2001

URBAN FUTURES
INCORPORATED

AN INTRODUCTION TO THE METHODOLOGY FOR POPULATION DISTRIBUTION IN THE SEA TO SKY CORRIDOR

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I. INTRODUCTION

Resident travel between spatially separate activity locations within a region is the major generator of demand for transportation services (the use of transportation infrastructure) and hence, ultimately, of the demand for transportation infrastructure itself. The projection of future demand for infrastructure, therefore, requires anticipation of the future location of both residents and activity locations.

This assignment involved two dimensions of resident demand for transportation services. The first was preparation of a scenario for the spatial allocation of residents of the Sea to Sky corridor area to 16 traffic zones within the corridor. The second was presentation of a scenario for the distribution of population within the Lower Mainland, tabulated by 5 sub-regions within the Lower Mainland.

In both cases, BC Statistics PEOPLE 26 population projections for local health areas were used as control totals, for both philosophical and pragmatic reasons. The philosophical reasons are that these projections are used by most public and private agencies as baseline projections, and hence provide a common frame of reference in the discussion of demographic change by regions. The pragmatic reason was that there were no resources available for the preparation of custom population projections.

While this may be generally accepted for the population distribution within the Lower Mainland, there may be more discussion of its implications for the distribution of resident population within the Sea to Sky corridor. It is important to keep in mind when considering the methodology used that the question to be answered in this assignment was not "What will the future population of the corridor area be?" but rather was "Given the projected total population of the area, how might it be allocated to the communities and traffic zones within the region?" A basic requirement of the assignment was that the sums of the populations of traffic zones in the corridor equal the control total from the PEOPLE 26 projections.

In turn, the methodology chosen for the traffic zone allocation assignment was based on both pragmatic and philosophical reasons. Ideally, allocation of population to spatial areas within a region are based on a detailed analysis of the topographical, geological, infrastructure and land use planning characteristics of each sub area to arrive at a measure of the relative potential resident capacity of each zone.

There was neither time nor funding available to carry out a capacity analysis: rather resources were limited to those necessary to develop a mathematical approach to the spatial allocation of population within the corridor. As described in the following sections, the methodology developed was based on historical trends in traffic zone population as a share of total regional population, modified to reflect the change in accessibility that would be required to support the magnitude of the projected population increase in the regional as a whole as projected by BC Statistics.

This report was prepared by Urban Futures Incorporated and commissioned by Transys International Consultants Limited. The information used in the conduct of this assignment and presented in this report has been compiled from sources believed to be reliable: their accuracy, however, cannot be guaranteed. Inquires about the contexts of the report should be addressed to Andrew Ramlo, Director, Urban Futures Incorporated.

II. TRAFFIC ZONE ALLOCATION METHODOLOGY

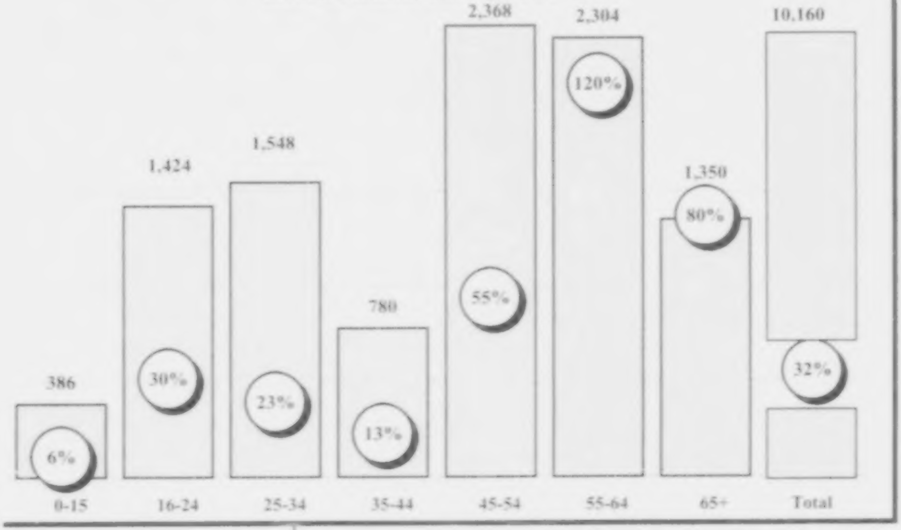
2.1 Control Totals

The Sea to Sky Corridor is contained within the Howe Sound Local Health Area (LHA). BC Statistics PEOPLE26 projection indicates that the population of this Local Health Region will increase from its 2000 population of 31,392 residents to 41,552 in 2010 and to 60,765 residents in 2025. This 94% increase over the next quarter century would make the Howe Sound Local Health Area the fourth fastest growing region in the province of British Columbia. The task of this assignment was to find a fast, efficient and affordable method of allocating the additional 29,373 residents to sub-areas within the region.

The BC Statistics Projection (Figure 1) indicates that the most rapidly increasing age group in the region over the 2001 to 2010 period will be the 55 to 64 age group, which will grow by 120 percent (2,304 residents), four times the rate of the LHA (32 percent growth). The 45 to 54 group will experience the greatest absolute increase, adding 2,368 residents over the next decade.

Figure 1

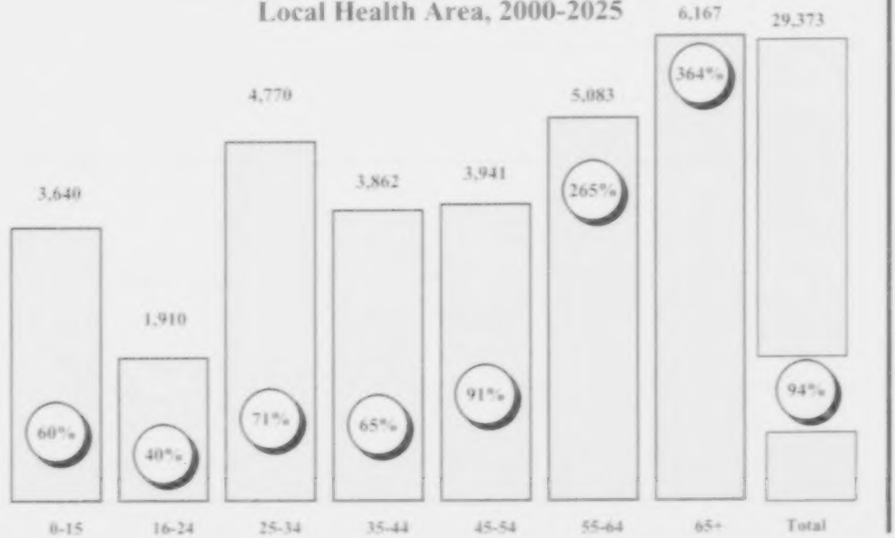
Projected Population Change, Howe Sound Local Health Area, 2000-2010



Over the longer term (Figure 2), the most rapidly increasing age group over the 2001 to 2025 period in the LHA will be the 65 plus age group, which is projected to add 6,167 residents and grow by 364

Figure 2

Projected Population Change, Howe Sound Local Health Area, 2000-2025



percent. The 55 to 64 are group is also expected to see growth rates considerably above that of the total Local Health Area, growing by 265 percent (5,083 residents). Total population growth in the LHA is expected to be 94 percent between 2001 and 2025.

2.2 Components of the Region

The Howe Sound LHA includes the Municipalities of Pemberton, Squamish and Whistler, plus 15 Indian Reserves and the unorganized areas included in Squamish Lillooet Regional District Sub-division B (Table 1). [Note that total presented here will not match counts from the Census of Canada as BC Stats estimates are adjusted for the census undercount].

Table 1. Historical Estimates

Howe Sound Local Health Area		1986 15804	1991 20512	1996 27185	2000 31392
BC Stats Municipal Estimates					
Pemberton	VL	360	518	899	1,657
Squamish	DM	10,532	12,027	14,578	15,357
Whistler	DM *	2,177	4,628	7,607	9,683
Squamish-Lillooet Sub B		1,487	1,920	2,297	2,656
Indian Reserves		1,248	1,419	1,804	2,039
Total		15,804	20,512	27,185	31,392
Allocated to Traffic Zones on Basis of 1991 and 1996 Census Small Area Data					
Whistler 9980			3,382	5,093	6,081
Whistler Creekside 9975			1,246	2,514	3,400
Brandywine Falls 9970					
Black Tusk Villiage 9965					0
Garibaldi 9960					
Brackendale 9950			2,642	3,023	3,182
Alice Lake 9955			188	181	190
Upper Squamish 9945			3,867	5,226	5,500
Garibaldi Highlands 9940			1,961	2,187	2,302
Squamish 9935			2,815	3,348	3,524
Stawamus Chief 9930			554	614	646
Shannon Falls 9925					
Murrin Lake 9920					
Britannnia Beach 9915			300	235	235
Furry Creek 9910					101
Porteau Cove 9905					
Not in Traffic Zones but in Howe Sound LHA			3,557	4,765	6,230
Total			20,512	27,185	31,392

Sixteen traffic zones have been defined within the Howe Sound LHA: historical population counts for these traffic zones were estimated using the 1991 and 1996 census small area population data. [Note that Pemberton and Mount Currie are not within a traffic zone, and hence their population, along with other areas, is treated as an external traffic source. It may be useful in future detailed modeling to treat at least Pemberton and Mount Currie as a traffic zone, given the potential for them to become a supplementary growth pole to Whistler Blackcombe.]

2.3 Method of Allocation of Population to Traffic Zones

Step 1

Census data for census years from 1971 to 1996 were used to tabulate base populations for the Howe Sound Local Health Area, the Village of Pemberton, the District Municipality of Squamish, the Resort Municipality of Whistler and Squamish-Lillooet Regional District Subdivision B. Total populations for each of the identified Indian Reserves were tabulated where available: however under and non-reporting for many of these areas do not allow for complete analysis of these populations.

Step 2

Population data for each of the Census periods was calibrated to account for the census undercount using BC Stats historical data for the Howe Sound Local Health area and estimated total population for municipal areas within the LHA. Estimates for population growth and change were tabulated by custom age groups (the 0-15, 16-24, 25-34, 35-44, 45-54, 55-64 and 65 plus) for 1996, 2001, 2010 and 2025 as requested.

Step 3

Total population grow was allocated to municipal sub areas on the basis of trends in historical shares modified by two major anticipated changes in the region. The first was the approach of Whistler's politically defined development caps. While these may limit the number of dwellings constructed in Whistler (if they are not politically redefined), there is no legal mechanism to control the number of people who occupy dwellings as a place of residence. Thus the caps will not function as a limit to population growth, but rather a mechanism to slow the rate of population growth from what would occur if historical trends in share of growth were to continue. As well, to the extent that the caps lead to price increases, it will increase the number of Whistler workers who will have to locate outside of the areas where construction of additional dwelling units is permitted.

The second major anticipated change affecting the allocation of population growth is the extent of population growth itself. Given the basic assumption that the projected population growth of 94 percent in the region over the next 25 years will be accommodated, there will have to be significant improvements in the transportation infrastructure to the region from the Lower Mainland. To the extent this occurs, Squamish will continue the trend observed over the past decade to become part of the Metropolitan Vancouver housing market. This, combined with the impact of limiting development in Whistler, will increase the share of growth accommodated in Squamish above the historical trend.

On the basis of the observed trends in share of population growth in municipalities and traffic zones, and these moderating influences, the following allocational rules were articulated:

The Village of Pemberton: Constant share of regional growth at the 11 percent observed over the past decade.

The District Municipality of Squamish: Increasing share of regional growth from the 29 percent observed over the past decade to 67 percent by 2025.

The Municipality of Whistler: Declining share of regional growth from the 47 percent observed over the past decade to 10 percent by 2025.

Squamish-Lillooet Subdivision B: Constant share of regional growth at the 7 percent observed over the past decade.

Indian Reserves: Increasing share from the 5 percent observed over the past decade to 6 percent by 2025

Step 4

In order to allocate the number of additional people anticipated within each of the above geographies to the 16 defined traffic zones, growth assumptions for each of the traffic zones were made based on the historical patterns of growth and change in each community. Assumptions for each zone were as follows:

The District Municipality of Squamish: Constant share of growth between all traffic zones.

The Municipality of Whistler: Declining share of growth in Whistler North Traffic Zone (9980), with an increasing share of growth in Traffic Zone (9975) centred on the Whistler Creekside area.

Squamish-Lillooet Subdivision B: As new communities both Britannia Beach (9915) and Furry Creek (9910) had relatively little or no population in 1996. Constant shares of 5 and 9 percent of Subdivision B's population were allocated to these traffic zones respectively. The remaining 86% of growth in Subdivision B was allocated to its other traffic zones on a constant share basis.

Indian Reserves: Not in traffic zones.

The results of this mathematical allocation process are shown on Table 2.

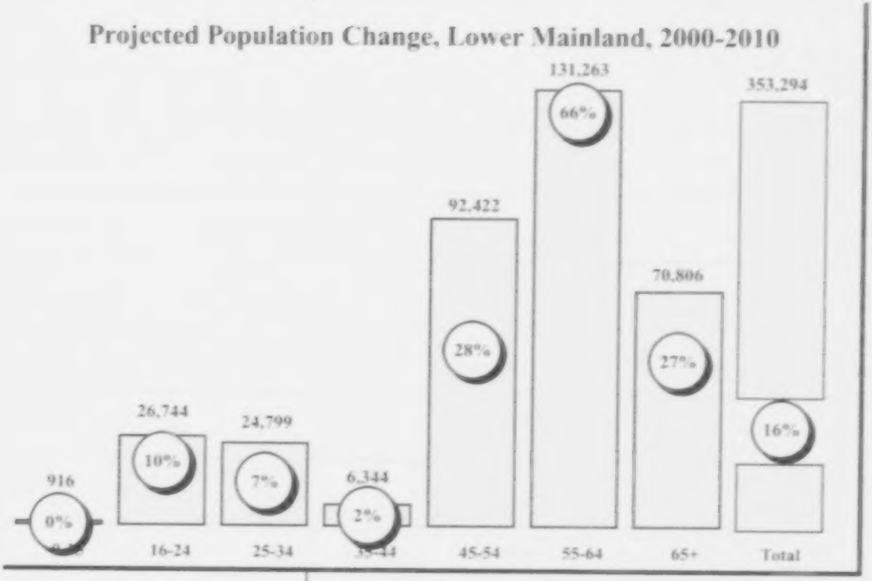
Table 2. Arithmetic Allcoation of Popualiton

Howe Sound Local Health Area		1986 15,804	1991 20,512	1996 27,185	2000 31,392	2010 41,552	2015 47,864	2020 54,296	 60
BC Stats Municipal Estimates									
Pemberton	VL	360	518	899	1,657	2,752	3,436	4,127	4
Squamish	DM	10,532	12,027	14,578	15,357	19,261	22,343	25,965	30
Whistler	DM *	2,177	4,628	7,607	9,683	13,551	15,297	16,596	17
Squamish-Lillooet Sub B		1,487	1,920	2,297	2,656	3,365	3,807	4,254	4
Indian Reserves		1,248	1,419	1,804	2,039	2,702	3,097	3,530	3
Total		15,804	20,512	27,185	31,392	41,631	47,981	54,471	60
Allocated to Traffic Zones on Basis of 1991 and 1996 Census Small Area Data									
Whistler 9980			3,382	5,093	6,081	7,835	8,404	8,663	8
Whistler Creekside 9975			1,246	2,514	3,400	5,689	6,860	7,895	8
Brandywine Falls 9970									
Black Tusk Villiage 9965					-	27	31	33	
Garibaldi 9960									
Brackendale 9950			2,642	3,023	3,182	4,004	4,643	5,392	6
Alice Lake 9955			188	181	190	239	277	322	
Upper Squamish 9945			3,867	5,226	5,500	6,922	8,026	9,322	10
Garibaldi Highlands 9940			1,961	2,187	2,302	2,897	3,359	3,902	4
Squamish 9935			2,815	3,348	3,524	4,435	5,142	5,972	6
Stawamus Chief 9930			554	614	646	813	943	1,095	1
Shannon Falls 9925									
Murrin Lake 9920									
Britannnia Beach 9915			300	235	235	293	332	371	
Furry Creek 9910					101	157	178	199	
Porteau Cove 9905									
Not in Traffic Zones but in Howe Sound LHA			3,557	4,765	6,230	8,320	9,787	11,306	12
Total			20,512	27,185	31,392	41,631	47,981	54,471	60

III. LOWER MAINLAND POPULATION DISTRIBUTION

Population projections for five sub-areas in the Lower Mainland were compiled from the BC Statistics PEOPLE 26 population projections for Local Health Areas. The Lower Mainland was defined to be all Local Health Areas in the Greater Vancouver Regional District and all those in the Fraser Valley region District with the exception of Hope. The five sub-areas for which tabulations were requested were Vancouver (the Vancouver, Burnaby and New Westminster LHAs), the North Shore (West Vancouver and North Vancouver LHAs), South of Fraser (Surrey, Langley and Delta LHAs), the North East (Coquitlam and Maple Ridge LHAs) and the Valley (Mission, Abbotsford and Chilliwack LHAs, excluding the Hope LHA)

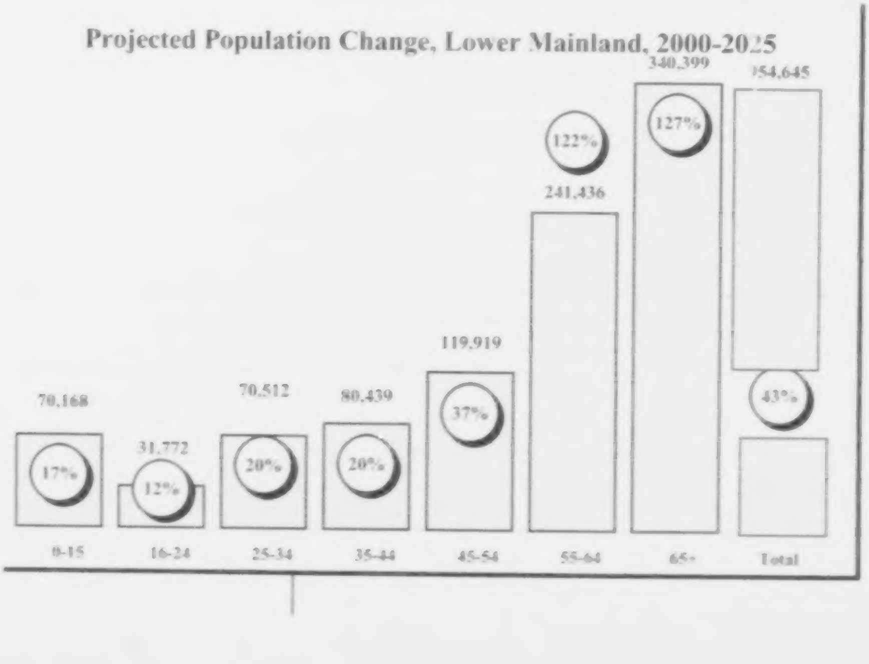
Figure 3



Projected Population Change, Lower Mainland, 2000-2010

Overall, in the next decade (Figure 3) this larger region is projected to increase by 353,294 people, or 16 percent. The 55 to 64 age group will see the largest growth, adding 131,263 residents (66 percent increase). Over the coming decade, the 45 to 54 and 65 plus groups will both grow more rapidly than total population, each growing by 28 and 27 percent respectively.

Figure 4



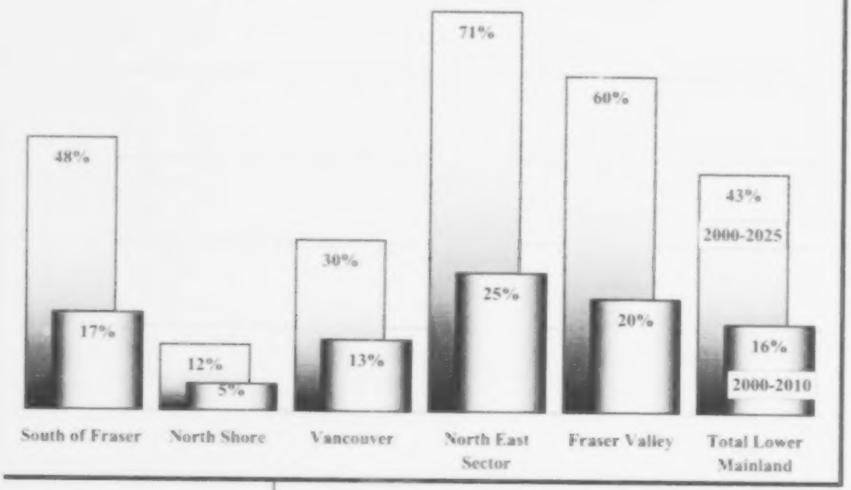
Projected Population Change, Lower Mainland, 2000-2025

Over the next 25 years (Figure 4) the most rapidly growing age group will be the 65 plus, projected to add 340,399 residents, growing by 127 percent. The 55 to 64 age group is anticipated to grow by 122 percent (241,436 residents). Over this period total population growth in the region is expected to be 43 percent, or 954,645 additional residents.

Within the Lower Mainland, over both the next 10 and 25 years the North East Sector (Coquitlam and Maple Ridge LHAs) is expected to see the greatest population growth; between 2001 and 2010 this sub-area is projected to grow by 24 percent and 70 percent over the next 25 years. Each of the North East Sector, the Fraser Valley and the South of Fraser sub-areas are projected to grow faster than the regional average, while the North Shore and Vancouver LHAs will grow considerably slower than this average (largely a result of these being the older built-up communities within the Lower Mainland with fewer new areas to develop).

Figure 5

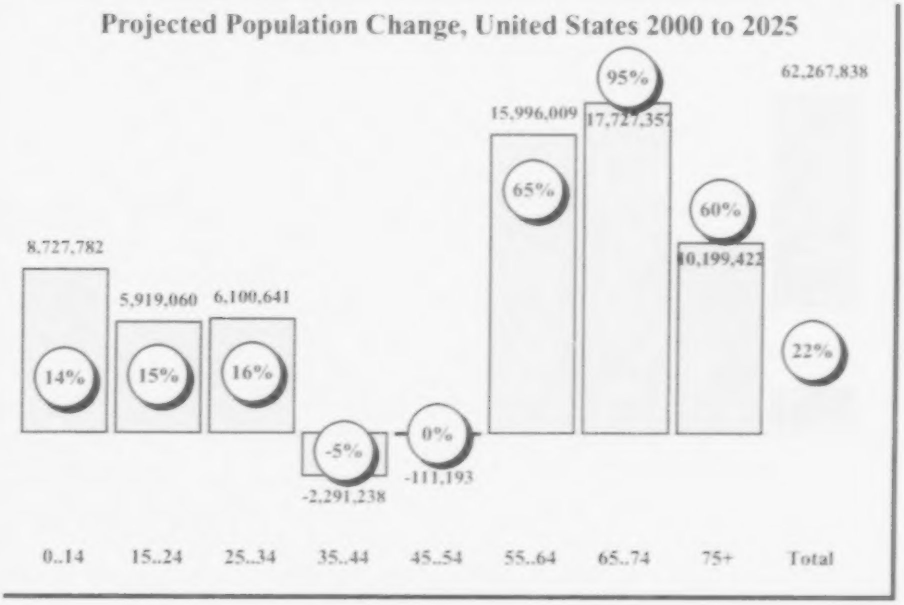
Projected Population Growth, Lower Mainland by Sub-Area, 2000-2010 and 2000-2025



Appendix D

An Introduction to the Demographics of External Trip Generation for the Sea-to-Sky Corridor

AN INTRODUCTION TO THE DEMOGRAPHICS OF EXTERNAL TRIP GENERATION FOR THE SEA TO SKY CORRIDOR


Projected Population Change, United States 2000 to 2025

URBAN FUTURES
INCORPORATED

Suite 212 - 515 West Pender Street Vancouver Canada V6B 6H5
tel: 604.682.8323 *fax:* 604.682.8388 *email:* mail@urbanfutures.com *www:* urbanfutures.com

AN INTRODUCTION TO THE DEMOGRAPHICS OF TRIP GENERATION FOR THE SEA TO SKY CORRIDOR

Prepared for:

TSi Consultants

November 2001

URBAN FUTURES
INCORPORATED

Suite 212 - 515 West Pender Street Vancouver Canada V6B 6H5
tel: 604.682.8323 *fax:* 604.682.8388 *email:* mail@urbanfutures.com *www:* urbanfutures.com

AN INTRODUCTION TO THE DEMOGRAPHICS OF TRIP GENERATION FOR THE SEA TO SKY CORRIDOR

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I. INTRODUCTION

1.1. Overview

There are a wide range of factors that will affect future external (non-resident) demand for travel, and hence transportation infrastructure, in the Sea to Sky Corridor. These include changes which will occur in source regions (for example, demographic, behavioural, income and price changes), in the interaction between the source region and the corridor (for example, in the cost and availability of inter-regional travel, and the perceived risks associated with it), in the attractiveness of competitor destinations (including both economic and non-economic factors) and in the attractiveness of corridor destinations.

While each of the multitude of factors will play both an independent and synergistic role, the net effects can be lumped into one of two categories. The first is the demographic character of the source region, measured by the size and age composition of the region's population: the second is the measured effective propensity of people in the source region to travel to destinations in the Sea to Sky corridor.

The base line calibration of a projection of travel from a source region is made by measuring the actual number of trips (by characteristic of traveler) made by people from the source region to destinations in the corridor, and calibrating this to the population (by corresponding characteristics) of the source region at the time the actual trips are counted to generate baseline trip generation propensities. Projections of the number of trips to be made at some point in the future are based on projections of the two elements used to estimate propensities: the projected population by characteristics and the corresponding projected propensities to travel to the region.

When travel propensities are held constant and are applied to the projected (changed) population, the result is the projected level of travel based solely on demographic change. This is often the most convenient method of projection of future levels of travel, as population projections for regions are generally available and the variables that determine the pattern of demographic change are relatively stable.

Such is not the case for the effective behavioural propensities. The data on which baseline calibration of trip propensities are generally from small samples and reflect constrained propensity, rather than potential. The factors that affect conditions in the source region, in the attractiveness of competing regions, in the effectiveness of travel between regions, and the actual and perceived attractiveness of destination are all difficult to measure and project, and highly volatile. It comes as no surprise, therefore, that demographic variables are given so much attention in travel projections.

When the internal and external environments for a destination region are relatively stable, reliance on demographically driven projections of future external travel demand is generally sufficient. In destination regions where change has been, is, and will be significant, the demographic variable can only form the foundation of the projection of future demand. Research on the range of variation in the propensities to travel between source and destination regions must be built on top of this foundation to establish the pattern of change that demography and behaviour will bring to travel to the corridor.

The purpose of this report is to provide a) a brief consideration of the factors within a region that may impact the behavioural propensities to travel to the region (found in the following section of this introduction), and b) the demographic foundation for projections of external region travel demand to the Sea to Sky corridor over the next 10 and 25 years (found in the following major sections of the report). The external regions considered are:

- British Columbia excluding the Sea to Sky Corridor and the Lower Mainland;
- Canada excluding the province of British Columbia;
- Japan;
- Western Europe;
- The United States of America by 4 major regions; and,
- Mexico.

In each case, summaries of changes in total population and population by age groups is presented. A companion report, A Methodology for Population Distribution in the Sea to Sky Corridor, documents the demographic pattern for population growth and change for the resident population, which includes population by traffic zone within the corridor and by major sub-region in the Lower Mainland.

This report was prepared by Urban Futures Incorporated and commissioned by Transys International Consultants Limited. The information used in the conduct of this assignment and presented in this report has been compiled from sources believed to be reliable: their accuracy, however, cannot be guaranteed. Inquires about the contexts of the report should be addressed to Andrew Ramlo, Director, Urban Futures Incorporated.

1.2. Introduction to Changing Propensities for Long Distance Travel

There are a wide range of purposes for visitor (i.e., non-resident) travel in the Sea to Sky corridor, ranging from day trips for skiing to extended summer stays for conventions, summer courses and long duration vacations. In each case the demand for such trips will be dependent upon the interaction between demographic, economic, and behavioural change in the external region; the characteristics of destination activity in the Sea to Sky corridor; the characteristics of destination activities in competing regions; and the accessibility of the corridor. Projections of future demand, therefore, will require making projections and assumptions, often implicitly, about the each of these dimensions of trip generation.

Consider, for example, changes in the accessibility of destination locations in the corridor. All other things equal, the greater the accessibility within and to the corridor, the greater the likelihood that trips will increase. Thus any projection of travel demand from external regions will involve making assumptions about the level of accessibility to and within the corridor; the lower the accessibility the lower the external effective demand.

Another example of factors that will change propensities of external travelers, particularly long haul travelers, to travel to destinations within the corridor are what are generally referred to as agglomeration economies. These describe the fact that the drawing power of a region increases more than proportionately to the increase of the number of destination activities (even if unrelated to the primary destination activity of the region) within it: the best example being a shopping mall or shopping street, where the combined pull of all of the shopping opportunities together is greater than the sum of their individual parts. The reason why an increase in the number of activities in an area leads to a more than proportionate increase in its attraction is that more activities both broadens the market (a greater range of people) and deepens it (as it gives the same people a much broader range of activities to participate in). These agglomeration economies are particularly important for long distance travelers, as it gives them more activities to amortize their travel costs across, thereby lessening the per unit cost of each one.

The agglomeration effect applies not only to activities within a region, but also to activities in adjacent regions. This is most important in long haul international travel, where increased destination activities in the lower mainland, on Vancouver Island, and in the rest of BC will increase the propensity to travel to destinations in the Sea to Sky corridor as a result of the larger region's increased drawing power. Thus, a detailed projection of travel demand in the corridor will require consideration of not only the accessibility to the region, but the expansion of activity opportunities within and adjacent to the region. Often these enhanced opportunities can overcome the effect of increasing costs of travel to a region.

A third, related factor that ties into agglomeration economies is branding of the region, where its external image moves from one of disparate individuals, to an experience represented by a single coherent image. As a region becomes branded in this way, its drawing power increases. Note that a brand is usually multi-dimensional, even though it is a single image. For example, Sydney Australia has been very successful in creating a multi-dimensional brand around its name that helps in overcoming the long haul travel costs of getting there.

These are but three examples of factors that can change the propensity of long distance travelers to visit destinations in the Sea to Sky corridor. Research into such factors will be necessary to determine the magnitude and direction that they will move visitor propensities: this will be particularly important in the case of visitor demand from Japan and Western Europe, where, as is discussed in the following sections, demographic fundamentals point to, all other things equal, declining travel to the region.

II. THE REST OF BRITISH COLUMBIA

In order to tabulate demographic data, the Canadian origin long distance travel market has been considered in two segments; people residing within the Rest of British Columbia outside of both the Sea To Sky Corridor and the Lower Mainland and those living throughout the other provinces (the Rest of Canada).

Figure 1

Rest of British Columbia, Population By Age Group, 2000-2010

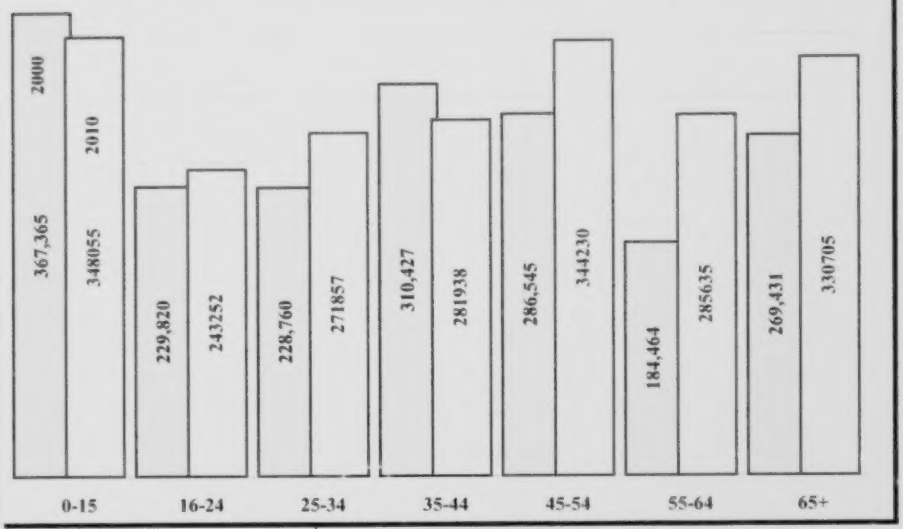
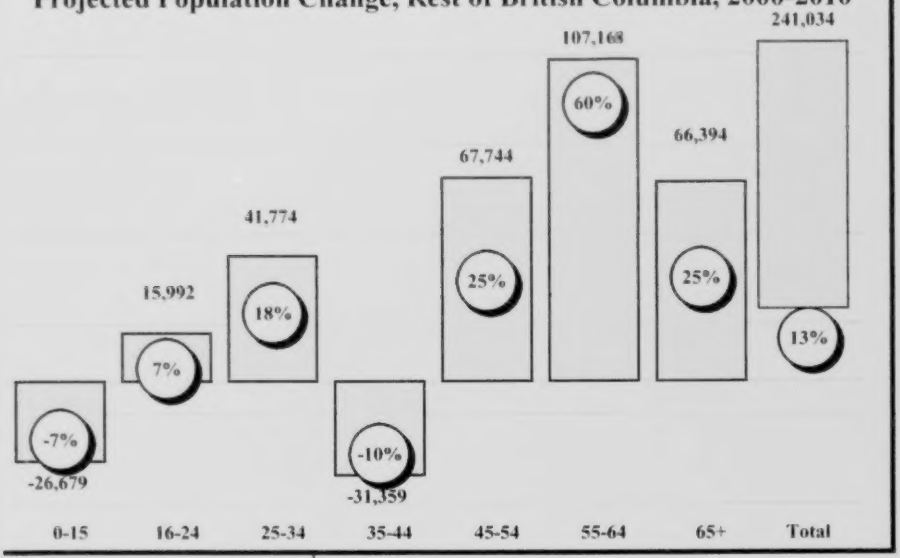


Figure 2

Projected Population Change, Rest of British Columbia, 2000-2010



British Columbia Statstics PEOPLE 26 projection[i] describes the change in the population of the Rest of British Columbia as it grows from its 2000 population of 1,864,638 to 2,105,672 by 2010. Over this decade the pattern of population growth and change in the Rest of British Columbia will involve slight declines in the population under the age of 15 (the result of the declining number of births in the province) and between the ages of 35 and 44 (the result of the aging of the bulk of the Post War Baby Boom out of this age group and into the 45 plus age group). Each of the other age groups will see growth, with the older age groups individually experiencing greater growth rates than what is projected for total population.

For example, over the next 10 years (Figure 2) the population of the Rest of British Columbia is projected to increase by 13 percent or 241,000 residents. The greatest percentage growth will be in the 55 to 64 age group followed by the 45 to 54 and 65 plus age groups (each growing by 25 percent). These age groups will also show the greatest absolute increase in people, with the 55 to 64 age group adding 107,170 people between 2000 and 2010, the 45 to 54 age group adding 67,740 people, and the 65 plus group adding 66,400 residents over the decade.

None of the under 45 age groups will grow as much as these older age cohorts in either percentage or absolute terms. The 25 to 34 age group will see strongest growth in the younger age groups, growing by 18 percent by adding 41,770 people. The 16 to 24 group will also grow, adding almost 16,000 people (7 percent growth). In contrast, the 0 to 15 and 35 and 44 age groups will decline, contracting by 26,780 (7 percent) and 31,360 (10 percent) respectively.

Figure 3

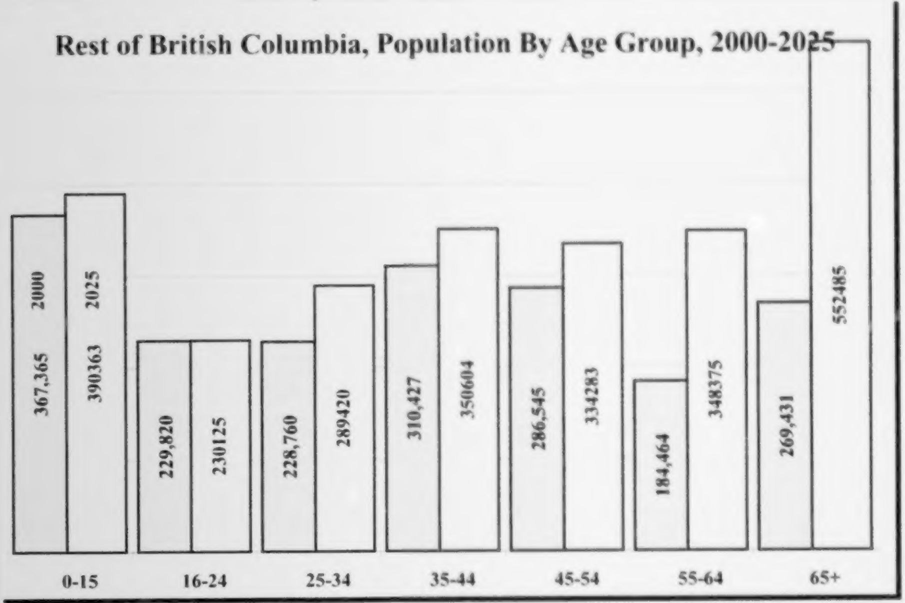
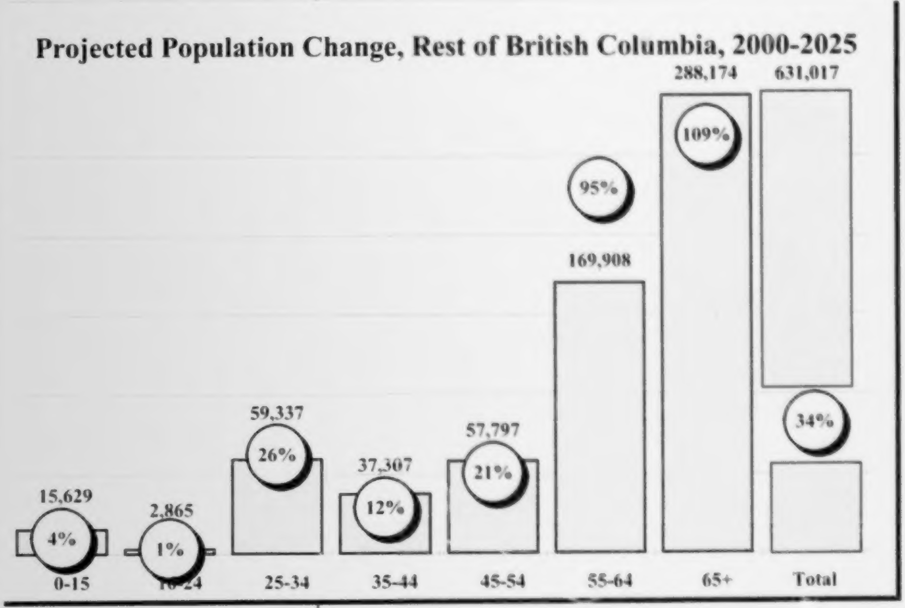


Figure 4



Over the next 25 years, the population of the Rest of BC is projected to increase by 631,000 people, from its 2000 population of 1,864,638 to 2,495,655 by 2025, with the largest absolute increase being the 288,000 person increase in the 65 plus population, accounting for 46 percent of total growth in the Rest of BC, as it grows from its current 269,431 population to 552,485 by 2025.

Over this 25 year period, all age cohorts are projected to increase (Figure 4). The greatest increases will again be in the older age groups, with the 65 plus age group leading the pack with a 288,174 person (109 percent) increase, followed by the 55 to 64 age group (169,900 more people, a 95 percent increase).

The significant growth of these two age groups will be the result of the aging of the entire baby boom into them over the next quarter century. The 25 to 34 and 45 to 54 age groups will follow with growth of 59,300 people (26 percent) and 57,800 people (21 percent). The remaining three age groups will experience slower absolute growth: the 0 to 15, 16 to 24 and 35 to 44 groups will grow by less than 12 percent, each adding 15,630 (4 percent), 2,870 (1 percent) and 37,300 (12 percent) people respectively.

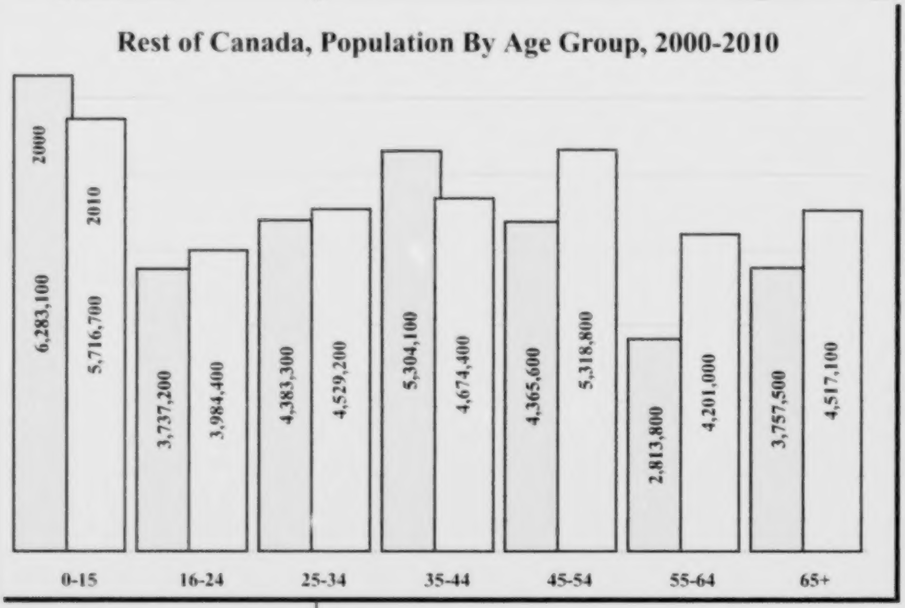
The aging of the bulk of the Rest of British Columbia's age profile in to the empty nester and retirement stages of the lifecycle over the coming decades indicates significant opportunity for growth in travel to the corridor from this segment of the population. The population in the younger age groups, dependent on net migration to the Rest of British Columbia and retention of people born within this region, will offer some potential for growing travel to the region. However, any significant increases will also be dependent on increasing the propensities for people in these age groups within the rest of the province to travel to the corridor.

III. THE REST OF CANADA

AN INTRODUCTION TO THE DEMOGRAPHICS OF TRIP GENERATION FOR THE SEA TO SKY CORRIDOR

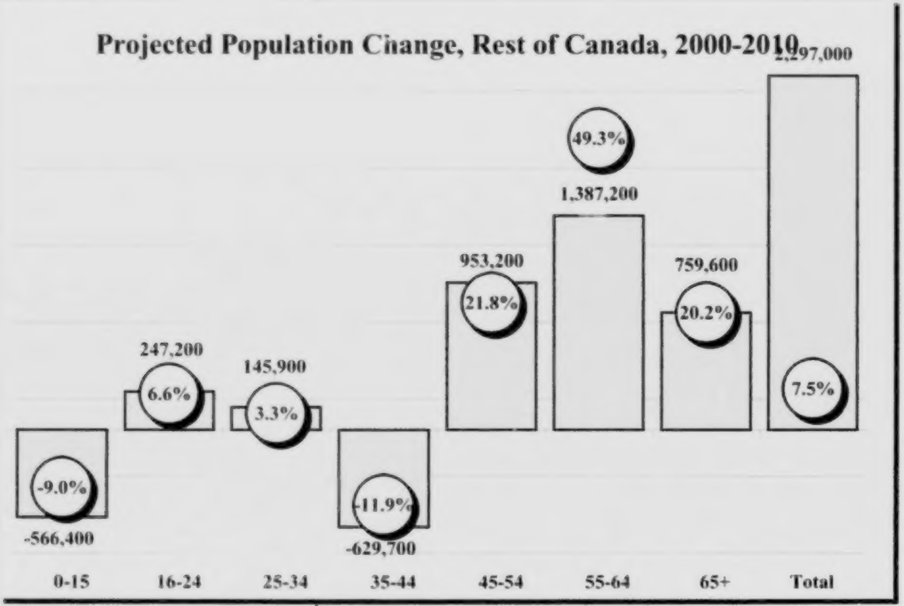
Statistics Canada's medium growth projection[ii] for Canada indicates that, over the next decade the population of the Rest of Canada (the other nine provinces and the three territories) will grow from its 2000 population of 28.1 million residents to 30.5 million residents by 2010, an increase of 2.3 million people (7.5 percent). While this growth in the population of the Rest of Canadian market will in itself have an impact on long distance destination travel to the Corridor, the change in the age composition of this population will have a much greater impact.

Figure 5



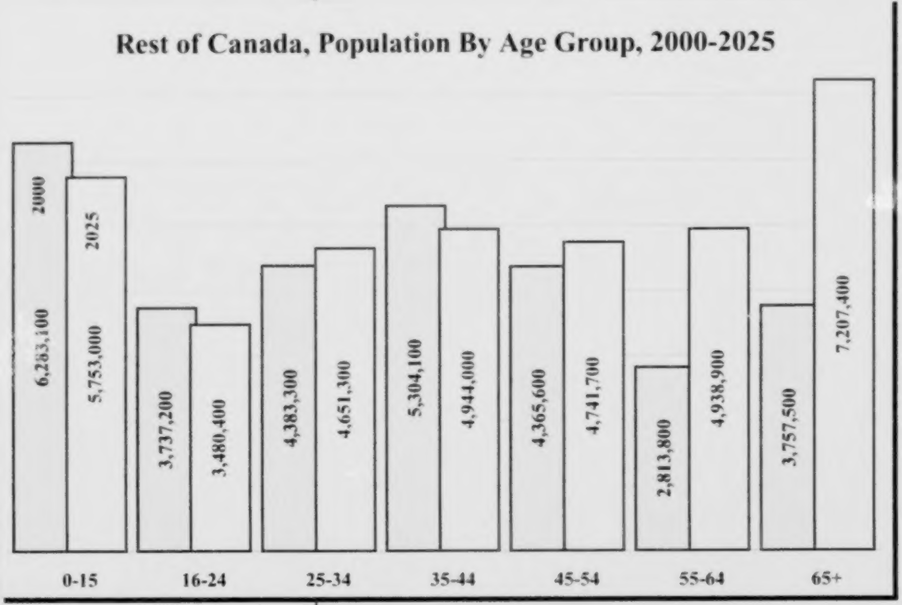
The pattern that will underlie population change and growth in the Rest of Canada over the next decade will be characterized by the aging of the leading edge of the post World War II Baby Boom Generation into the empty nester and retirement stages of the lifecycle. The 45 to 54, 55 to 64 and 65 plus age groups will all increase by between 20 and 50 percent, compared to an average growth of 7.5%, while the younger age groups will either grow relatively slowly (the 16 to 25 and 25 to 34 age groups) or decline (the 0 to 15 and 35 to 44 age groups).

Figure 6



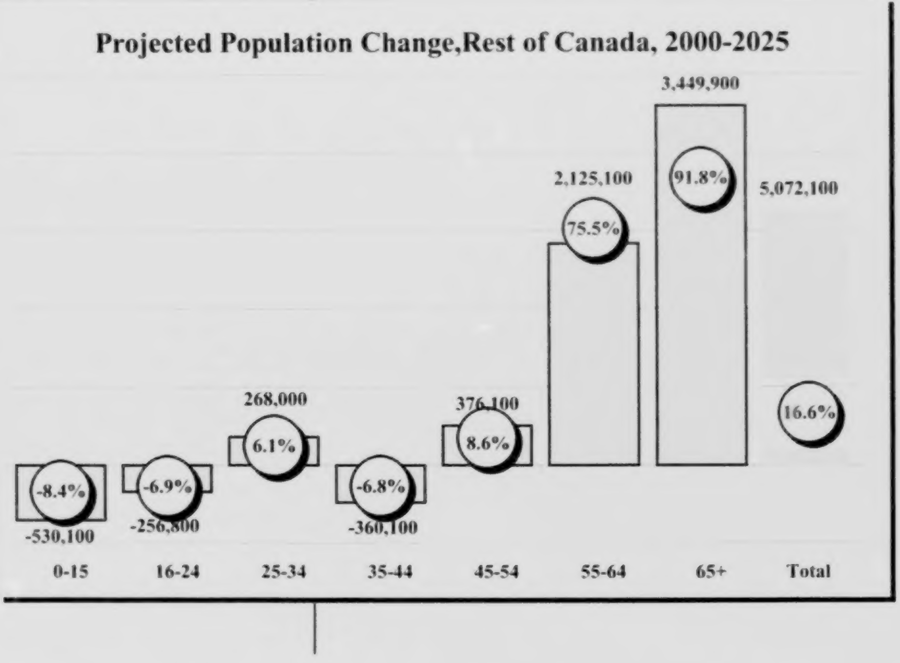
Over the next decade (Figure 6) the greatest percentage growth will be in the 55 to 64 age group (growing by 49 percent), the 45 to 54 age group (growing by 22 percent) and the 65 plus age group (growing by 20 percent). These age groups will also show the greatest absolute increase in people, with the 55 to 64 age group increasing by 1.4 million people between 2000 and 2010, the 45 to 54 age group adding just under one million people and the 75 plus group adding almost 760,000 residents. Although there will still be a significant number of people in the younger age groups in 2010 (Figure 5), none will grow as fast as the older age cohorts. The 16 to 24 and 25 to 34 age groups will each add 247,000 (7 percent increase) and 146,000 people (3 percent) respectively, while 35 and 44 age group will decline by 630,000 people (a 12 percent drop), and the population under the age of 15 will decline by 566,000 people (9 percent).

Figure 7



Rest of Canada, Population By Age Group, 2000-2025

Figure 8



Projected Population Change,Rest of Canada, 2000-2025

The population of the Rest of Canada is projected to increase from 2000's 30,644,600 people to 35,716,700 in 2025, an increase of 5.1 million people (17 percent). Over this period, the aging of the Baby Boom generation into the empty nester and retirement stages of the lifecycle will be reflected in the changes in the country's age structure: today's 45 to 54 age group will have aged into the 70 plus age group, and the 25 to 34 age group will have aged into the 50 to 64 age group, bringing continued growth to the number of people in older age groups (Figure 7). Conversely, given the relatively small number of births that have occurred over the past 25 years, and the relatively small number that will occur over the next 25, there will be fewer people in the under 25 population.

The largest absolute increase in the number of people in an age group over this period will be the 3.4 million person (92 percent) increase in the 65 plus population (Figure 8). The 55 to 64 age group will also experience significant growth, adding in the range of 2.1 million (76 percent more) people. Over the same period the 45 to 54 and 25 to 34 age groups will follow with growth of 376,000 (9 percent) and 268,000 (6 percent) people respectively. The remaining three age groups will all experience declines: the 0 to 15 age group is projected to decline by 530,000 people (8 percent), the 16 to 24 by 257,000 people (7 percent) and 34 to 44 group by 360,000 people (7 percent).

Over the next decade, significant growth in the population over the age of 45, where disposable incomes and the propensity to vacation grow, will provide the opportunity for an increase in the number of trips to the region by people in this older age group from the Rest of Canada without increasing propensities to travel. Conversely, in the absence of increased effective attraction to the region for younger residents of the Rest of Canada, there would be declines in the number of trips to the region from the under 45 population.

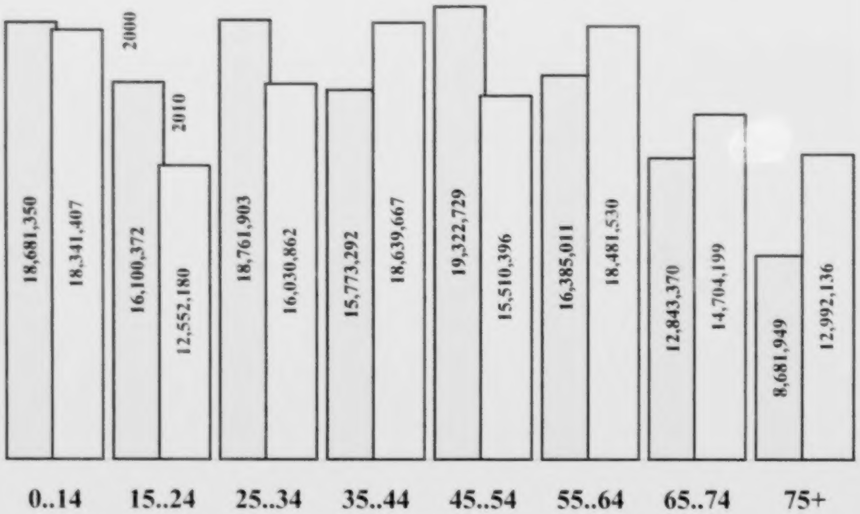
IV. JAPAN

One of the historical icons for tourism in British Columbia in general is a Japanese tourist: for Whistler/Blackcomb in specific, it is a young Japanese skier/boarder. The changing demographics of Japan will have a significant impact on the importance of these icon: the decline and aging of Japan's population over the coming years will require a significant increase in the region's market share of Japanese tourists just to ensure maintenance of current volumes of tourism, both destination and agglomeration.

The total population of Japan is projected[iii] to increase from its current 126,550,000 to 127,252,000 in 2010 and then to decline to 120,235,000 by 2025. This pattern of change is driven by Japan's long life expectancies being able to offset the consequences of its below the replacement level birth rate over the next decade (Japan's population will begin to decline by 2007), but not being able to do so over the longer run. It is expected to increase by only 700,000 people (a 0.6 percent increase over 10 years) over the next decade, and to decline by 6.3 million people (a 5 percent decline) over the next quarter century.

Figure 9

Japan, Number of People By Age Group, 2000-2010

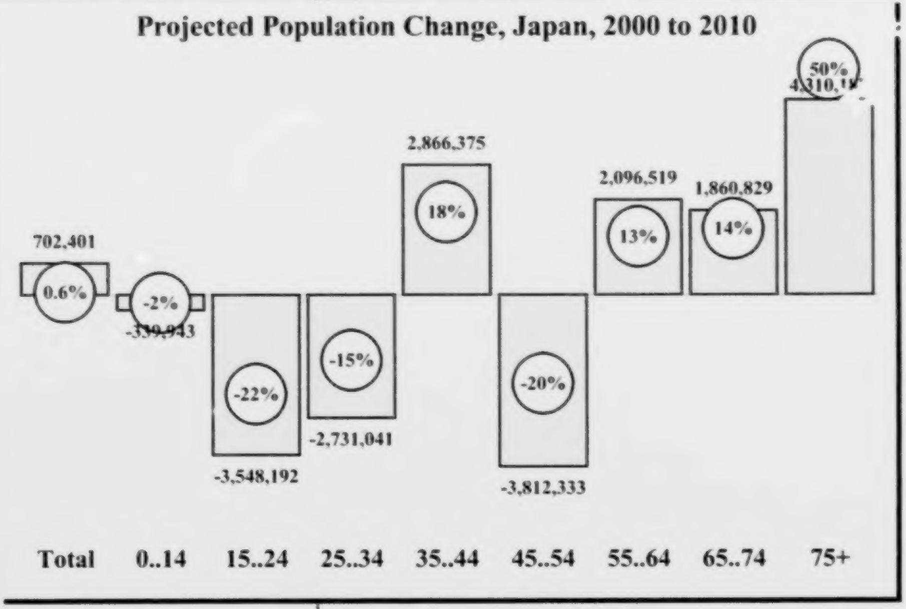


The fact that Japan's population is going to grow slowly and then to decline does not mean that its population is not going to change: the changes in Japan's age composition will be dramatic, and will have a much greater impact on tourism demand than the overall change in its total population.

In every age group 55 and older, and in the 35 to 44 age group, there will be more people in 2010 than there are today: in every age group under the age of 35 and in the 45 to 54 age group, there will be fewer. This pattern will be the result of the aging of today's age profile, with its bulges in the 45 to 54 and 25 to 34 age groups, into the older age groups over the next decades (Figure 9). The 700,000 person increase in Japan's population will be the net result of a 6.6 million person decline in the under 34 population, a 2.9 million increase in the 35 to 44, a 3.8 million decline in the 45 to 54 and a 8.2 million increase in the 55 plus age groups.

The greatest percentage declines over the next decade (Figure 10) will be in the 15 to 24 age group (declining by 22 percent) the 25 to 34 age group (declining by 15 percent) and the 45 to 54 age group (declining by 20 percent). These age groups will also demonstrate the greatest absolute declines, with the 15 to 24 age group in 2010 being 3.6 million people smaller than it was in 2000, the 25 to 34 age group 2.7 million persons smaller and the 45 to 54 age group 3.8 million persons smaller. There will still be a significant number of people in these age groups in Japan in 2010 (for example, there will be 16 million 25 to 34 year olds). In order to maintain the current number of people from this age group visiting in the Sea to Sky corridor, however, would require a 17 percent increase in the participation rate for this age group. Without efforts to increase the attraction, it would be reasonable to anticipate declines of 15 percent to 20 percent trips from this source.

Figure 10



Projected Population Change, Japan, 2000 to 2010

Conversely, it would be reasonable, even without increased attraction, to anticipate increases in the number of trips to the region from the 35 to 44 age group (projected to increase by 2.9 million people, an 18 percent increase), from the 55 to 64 age group (increasing by 2.1 million people, 13 percent), from the 65 to 74 age group (1.9 million more, 14 percent) and the 75 plus age group, which is projected to increase by 4.3 million people, a 50 percent increase over the next decade. The extent to which additional tourists from these age groups can offset the declines, not only in trips but also in indirect and direct employment requirement, will raise significant issues for the region's economy.

Over the longer run, the consequences of a below the replacement level birth rate and no net immigration will clearly be reflected in the changes in Japan's age structure. Today's 45 to 54 age group will have aged into the 70 plus age group, and its 25 to 34 age group will have aged into the 50 to 59 age group (Figure 11). Given the relatively small number of births that have occurred over the past twenty-five years, and the relatively small number that will occur over the next

25, there will not be enough young people in Japan to replace the current population as it ages.

The result will be a dramatic decline over the next twenty five years in not only the total population of Japan (by 5 percent, 6.3 million fewer people), but in every age group under the age of 65 (Figure 12). The greatest absolute decline will be the 6.7 million person (36 percent) fall in the number of people aged 25 to 34: any firm or industry that is currently dependant upon consumption of people in this age group have better plan on diversification, a much greater participation rate from the age group, or a lot less business. The 0 to 14 and 15 to 24 age group will also experience significant declines, in the range of 3.7 million (20 percent) and 3.9 million persons (24 percent) respectively, with the 35 to 44 age group following with a 1.9 million person (12 percent) decline. The 45 to 54 and 55 to 64 age groups will also decline, albeit more modestly, by 1.2 million (6 percent) and 0.6 million (3 percent) respectively.

Figure 11

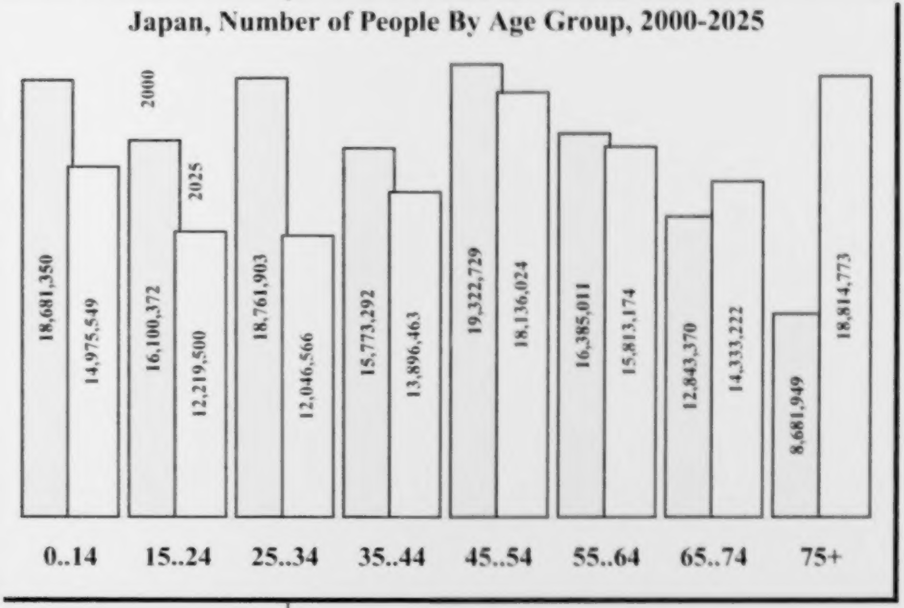
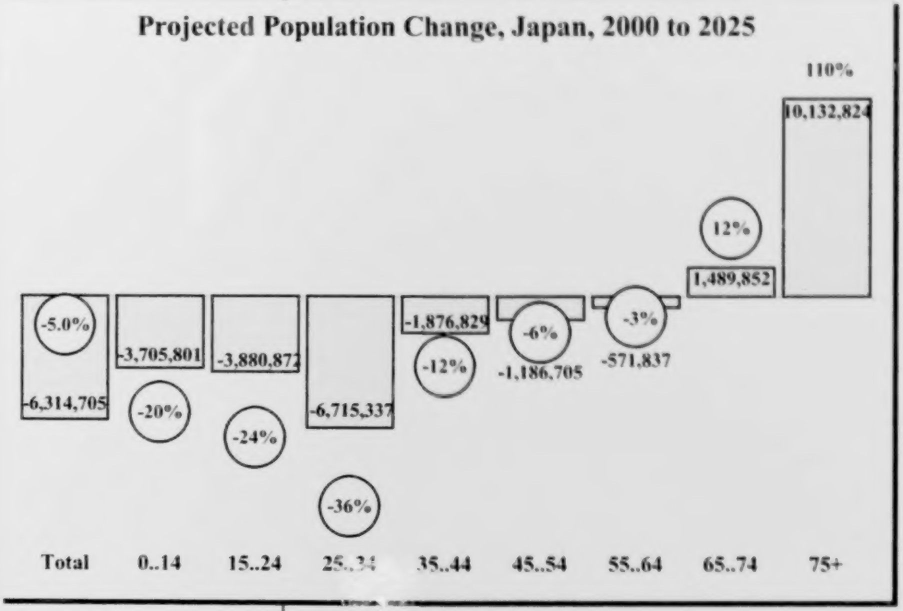


Figure 12



In contrast, the 65 to 74 age group will increase by 1.5 million persons, a 12 percent increase from 8.7 million people in 2000 to 14.3 million in 2025. The biggest increase, however, will be the 10.1 million increase in the 75 plus population, from 8.7 million people in 2000 to 18.8 million in 2025. This 110 percent increase in the 75 plus population will be the inevitable result of the aging of today's 19.3 million 45 to 54 year olds, and 16.3 million 55 to 64 year olds into the 75 plus age group as they enjoy what are currently the world's longest life expectancies.

Without dramatic change in the birth and death rates in Japan, which is highly unlikely to happen given current technology and attitudes, or travel behaviour of the Japanese population, every market dependant on tourism from Japan will face significant declines over the coming quarter century. The greatest declines will be in the under 45 age groups, and hence activities focused on these age groups will be most impacted.

Over the next 25 years the population of Japan is projected to decline by 6.3 million people. This will be the net result of the 11.6 million person increase in the 65 plus population (the result of the aging of its current population) and an 18 million person decline in the number of people under the age of 65.

Increasing repeat business (building brand loyalty), a wider range and level of opportunity, and agglomeration effects will all be required to offset the demographically based demand reduction from Japan.

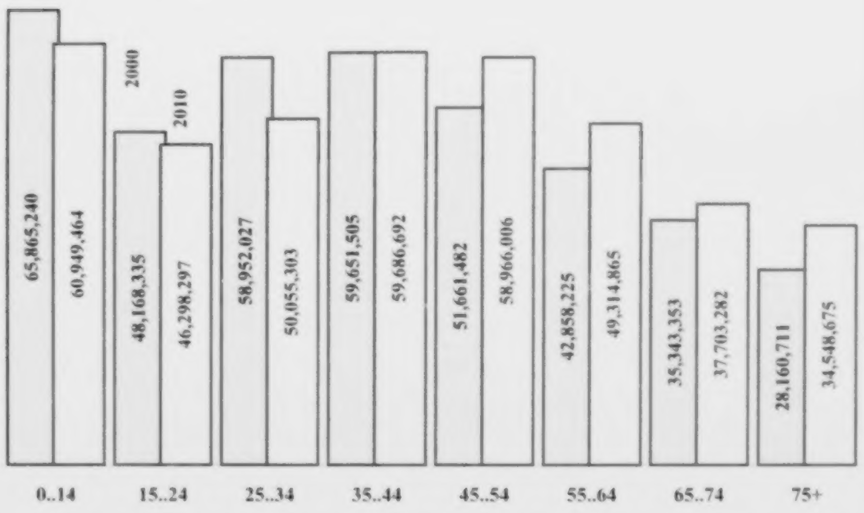
V. WESTERN EUROPE

Another historic source for British Columbia tourism is Western Europe. As in the case of Japan, changing demographics of Western European countries will have an impact on the significance of this market on BC tourism; maintaining current volumes of tourists will also require a significant increase in the destination corridor's and southwest British Columbia's market share of Western European travelers.

The population of Western Europe is projected[iv] to increase from its current 391 million to 397 million in 2010, and remain in this range, with a projected 2025 population of 396 million. As in the Japanese context, this pattern will be the result of long life expectancies and below the replacement level birth rates that characterize Western European countries.

Figure 13

Western Europe, Number of People By Age Group, 2000-2010



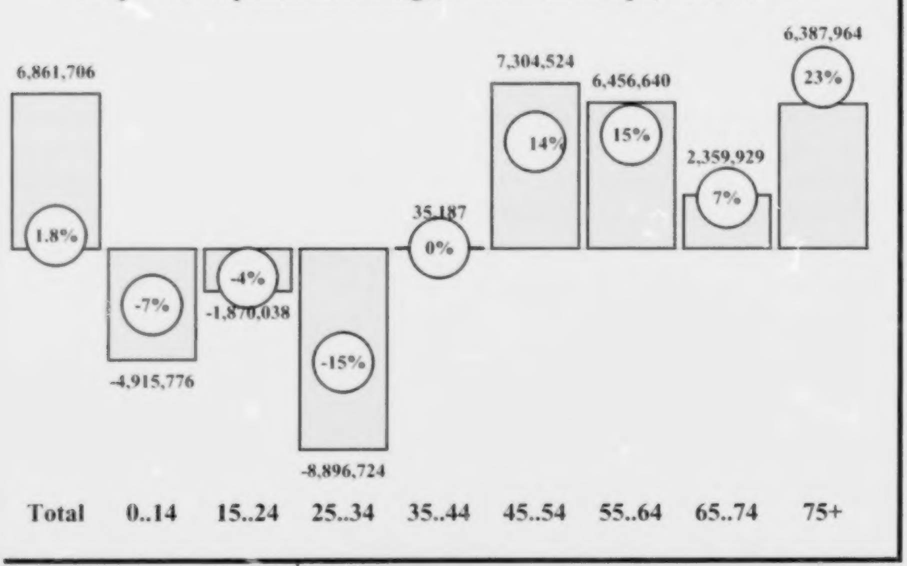
The aging of Western European residents will have a much more dramatic impact on its population composition, and hence on tourism demand, than is shown by changes in its total population. In every age group over the age of 35 there will be more people in 2010 than there are today; in every age group under the age of 35 there will be fewer (Figure 13). The total growth in the population of 6.9 million will be the result of a loss of 15.7 million people under the age of 35, a gain of 22.6 million over the age of 45 and no change in the 35 to 44 age group. This pattern will be the result of the shifting of today's age profile, with a bulge in the 35 to 54 age group, into the older age groups over the next decade.

Over this period the greatest percentage declines will be seen in the 25 to 34 age group (15 percent decline) and the zero to 14 age group (7 percent). These age groups will also experience the greatest absolute declines, of 8.8 million and 4.9 million respectively over the decade.

In spite of these declines, there will still be a significant number of people in these age groups, with 61 million children, 46 million 15 to 24 year olds and 50 million 25 to 34 years olds in Western Europe in 2010. Without efforts to increase the market share, it would be reasonable to anticipate a decline in the number of trips generated from these age cohorts.

Contrasting declining trips from this market segment would be increases from the over 35 population, as every age group is either projected to remain constant (35 to 44 age group growing by only 35,000 people) or increase by between 7 and 23 percent (Figure 14).

Figure 14



Projected Population Change, Western Europe, 2000 to 2010

The 45 to 54 age group is anticipated to increase by 7.3 million people (a 14 percent increase), the 55 to 64 age group will add 6.5 million residents (15 percent increase), the 65 to 74 group will grow by 2.4 million (7 percent) and the 75 plus age group will grow by over 23 percent as it adds 4.3 million people. The projected 6.9 million growth of Western Europe's population will mean a significant shift in the age group, and hence activity, income and service requirements of the patrons.

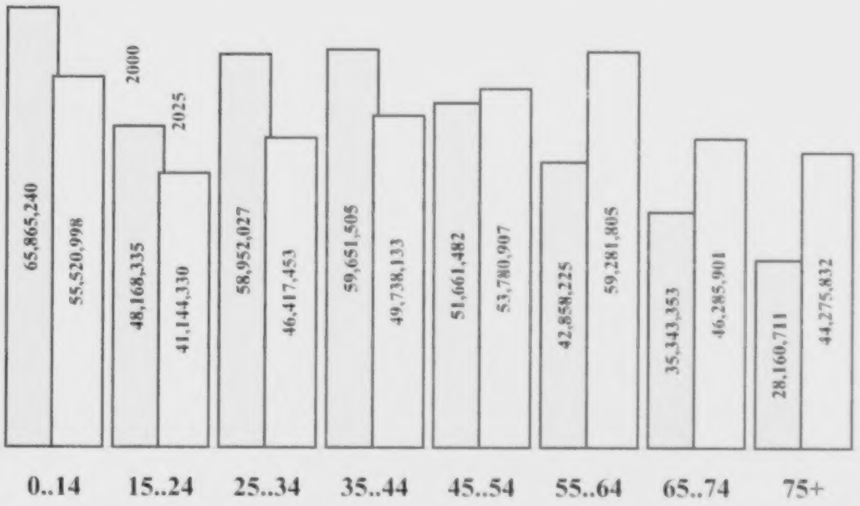
The below the replacement level birth rates that prevail in Western Europe will be reflected more significantly over the longer run. Over the next 25 years today's bulge in the 35 to 54 age group will have aged into the 60 plus age group. Given the relatively small number of births that have occurred in Western Europe over the past twenty-five years, and the relatively small number that will occur over the next 25, there will not be enough young people to replace the current population as it ages.

The net result of population change over the next 25 years will be a slight increase in total population (by 1.5 percent or 5.8 million people), accompanied by a dramatic change in age composition (Figures15, 16).

The age group that will experience the greatest absolute decline will be the 12.5 million person (21 percent) reduction in the number of people aged 25 to 34. The zero to 14, 15 to 24 and 35 to 44 age groups will also experience significant declines, in the range of 7 million to 9 million people. In contrast, the population over the age of 45 will increase, by between the 2.1 million (4 percent) growth in the 45 to 54 age group, the 16.1 million (57 percent) additional people in the 75 plus age group and the 16.4 million (38 percent) additional residents seen in the 55 to 64 age group.

Figure 15

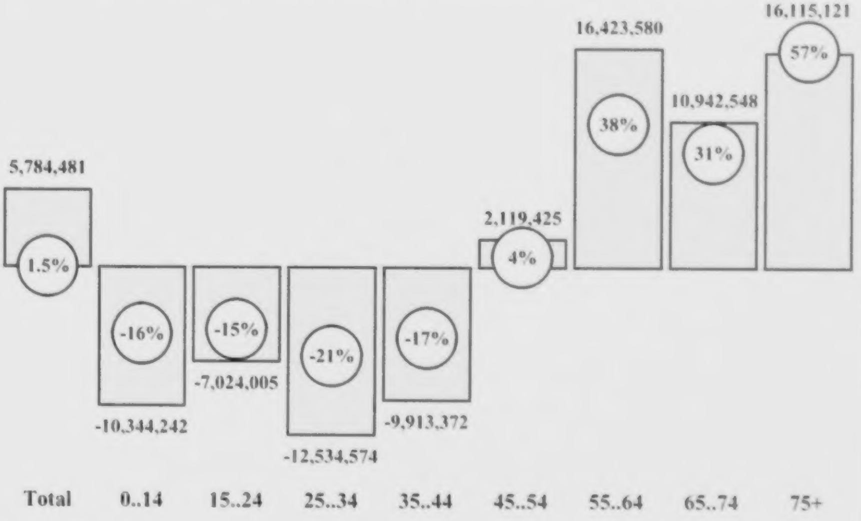
Western Europe, Number of People By Age Group, 2000-2025



As in Japan, without unlikely changes in birth and death rates in Western Europe or in the travel behaviour of the Western European population, markets dependant on tourism from these sources will face significant challenges over the coming quarter century. The declines will be in the under 45 age groups, and hence activities focused on these age groups will be most impacted. It would also be reasonable to anticipate significant increases in competition from tourist destinations in Western Europe (and elsewhere) for the under 45 travelers as they face an 18 percent decline in their domestic supply of under 45 customers.

Figure 16

Projected Population Change, Western Europe, 2000 to 2025



VI. THE UNITED STATES

In dramatic contrast to the barely growing and rapidly aging populations of Japan and Western Europe, the population of The United States is projected[v] to grow significantly, and to grow in younger age groups. Between 2000 and 2010 the population of the United States is projected to increase by 8% from 281 million to 305 million residents, an increase of 24 million people (Figure 17). While one dimension of the pattern of change will be the same as is found in Japan and Western Europe (that of the aging of a post-war baby boom with long life expectancies), another is not. The United States enjoys both a replacement level birth rate and immigration, and hence can anticipate modest increases in the number of young people in the country.

Figure 17

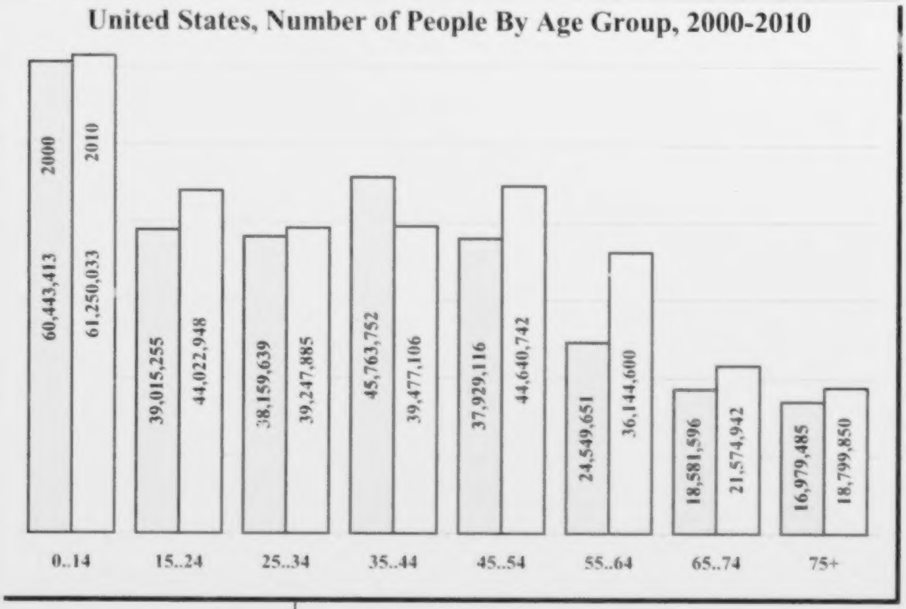
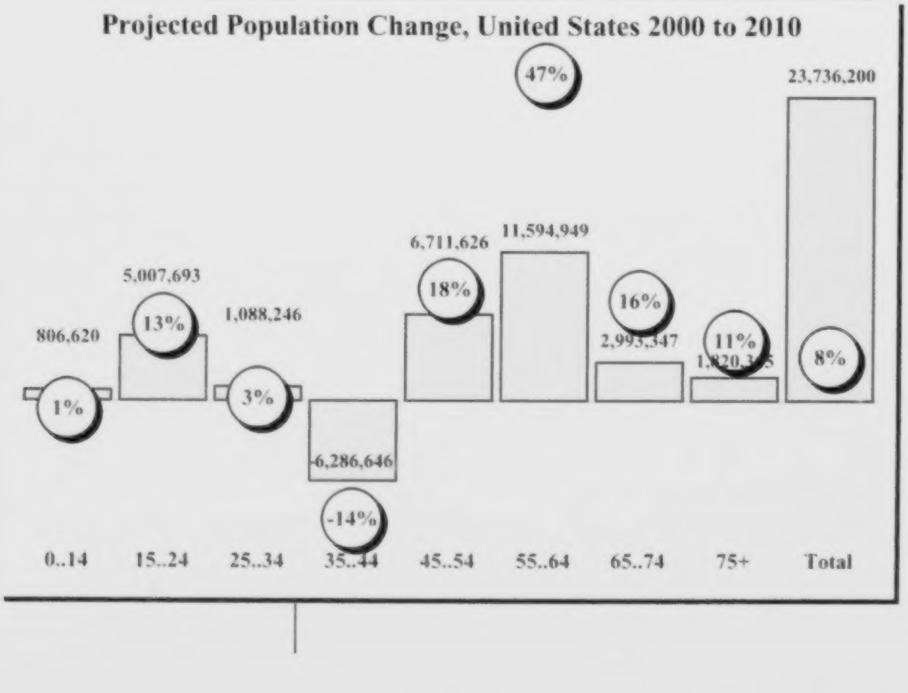


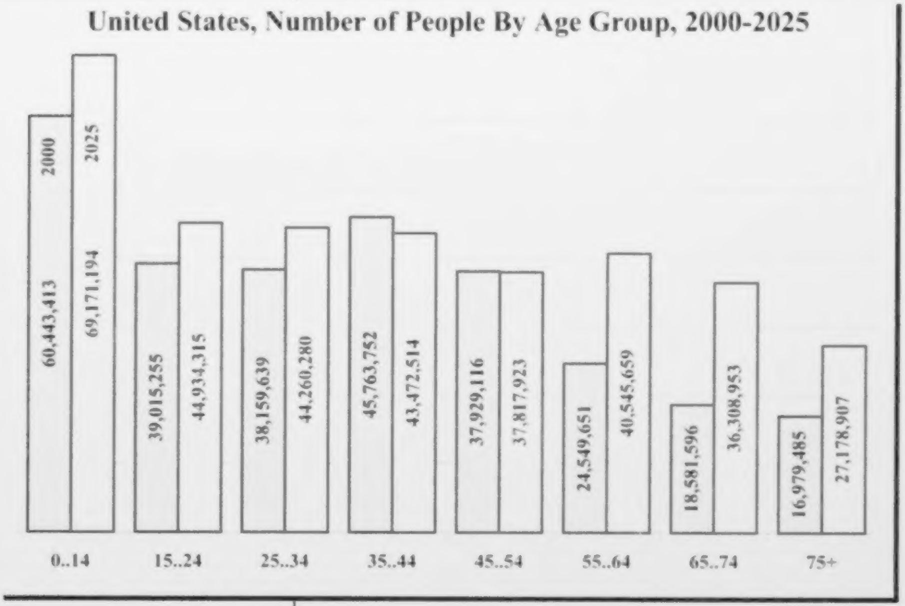
Figure 18



Between 2000 and 2010, in every age group over the age of 45 and under the age of 35 there will be more people in 2010 than there were in 2000. The greatest relative growth will be in the 55 to 64 age group (growing by 47 percent), followed by the 45 to 54 group (18 percent) and the 65 to 74 group (16 percent). The fourth fastest growing age group will be the 15 to 24 age group, which will increase by 13 percent, and which will experience the third fastest absolute increase, adding 5 million people over the next decade. The greatest absolute growth will be in the fastest growing 55 to 64 age group (adding 14.6 million people) and the 45 to 54 age group (adding 6.7 million): this growth is the result of the aging of the country's post war baby boom.

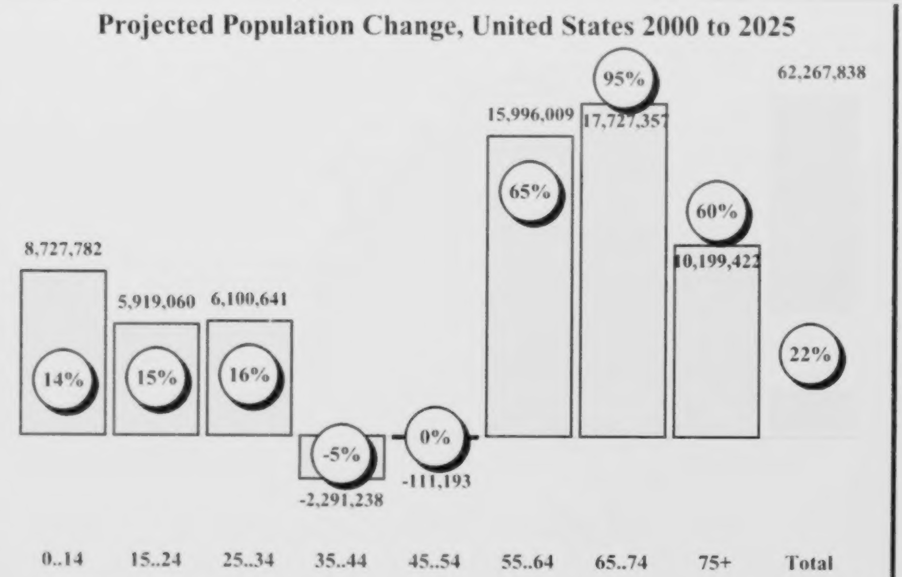
Over the same period the 35 to 44 age group will decline by 6.3 million persons (a 14 percent decline) as the bulk of the baby boom generation ages in to the 45 to 54 age group. Although there will still be a significant number of people in this age group in 2010 (39.5 million of them, Figure 19), more people than there is in Canada today), in order to maintain the same number of visitors from this age group it will be necessary for propensities to travel to the Sea to Sky corridor to increase, or for increasing market share from the stock.

Figure 19


United States, Number of People By Age Group, 2000-2025

To some extent, this pattern of change will prevail in a magnified form over the longer run. The population of the United States is projected to grow by 62 million people over the next 25 years, a 22% increase from today's 281 million to 343 people in 2025. The addition of a population equivalent to that of two Canadas to the population of the United States over the next quarter century dramatic impact.

Figure 20


Projected Population Change, United States 2000 to 2025

Even more significant will be changes in the underlying composition of this growth. Today's 45 to 54 age group will have aged into the 70 plus age group, and its 25 to 34 age group will have aged into the 50 to 59 age group, resulting in dramatic growth in the 55 and over age cohorts (Figure 20). The greatest absolute and relative increase will be the 17.7 million person (95 percent) growth in the number of people aged 65 to 74, followed by the 16.0 million (65 percent) increase in the 55 to 64 age group and the 10.2 million (60 percent) growth in the population over the age of 75. This aging of the population of the United States will hold significant opportunities and challenges for destination activities in the Sea to Sky corridor.

Changes in the number of people in the under 55 age groups will be relatively more modest in both rate and magnitude. The 0 to 14, 15 to 24 and 25 to 34 age groups will also experience increases, in the range of 15 percent over the next 25 years, adding in the range of 6 to 8 million persons. The 35 to 44 and 45 to 54 age groups will each contract slightly, experiencing declines of 2.3 million (five percent decline), and 111,000 people respectively .

The growth and change in the population of the United States will not be uniform across all regions of the country. As the following charts show:

- The vast majority of growth projected in the United States will be concentrated in the Western and Southern regions. Each of these regions will add 26.5 and 24.6 million residents respectively[vi].
- Each of the Northeast and Midwest regions will experience declines in populations between the ages of 35 and 54.
- The decline of specific age groups will be less prominent in the Southern region where only the population between the ages of 35 and 44 will decline. All other age groups in this region are projected to grow over the next 25 years.
- The Western region will not follow either national or other regional patterns; all age groups in this region are expected to grow between 2000 and 2025.

Figure 21

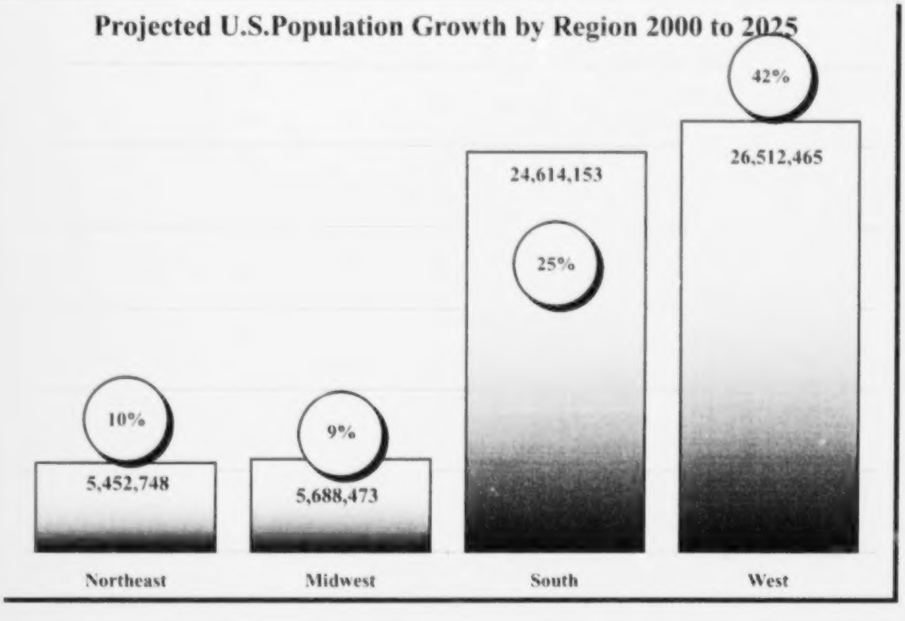


Figure 22

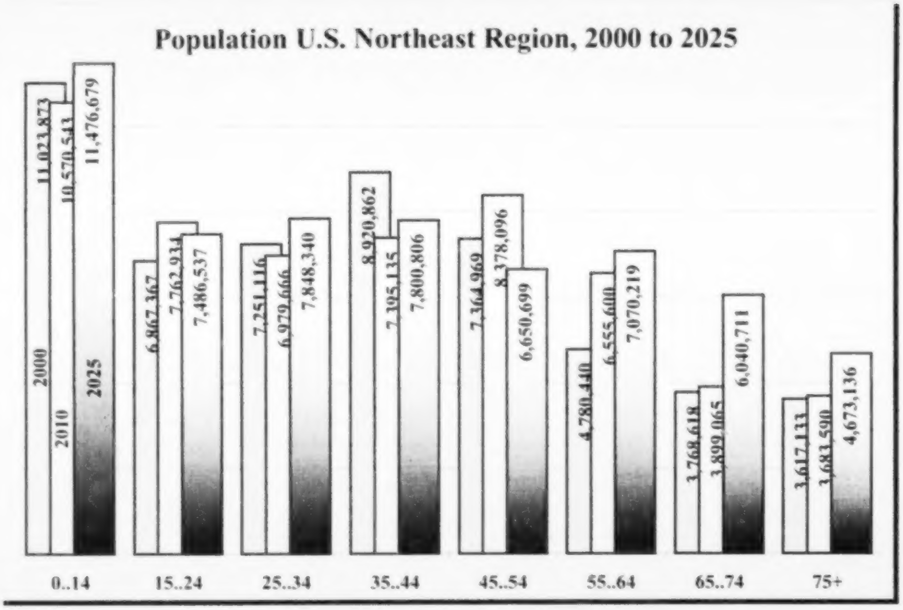


Figure 23

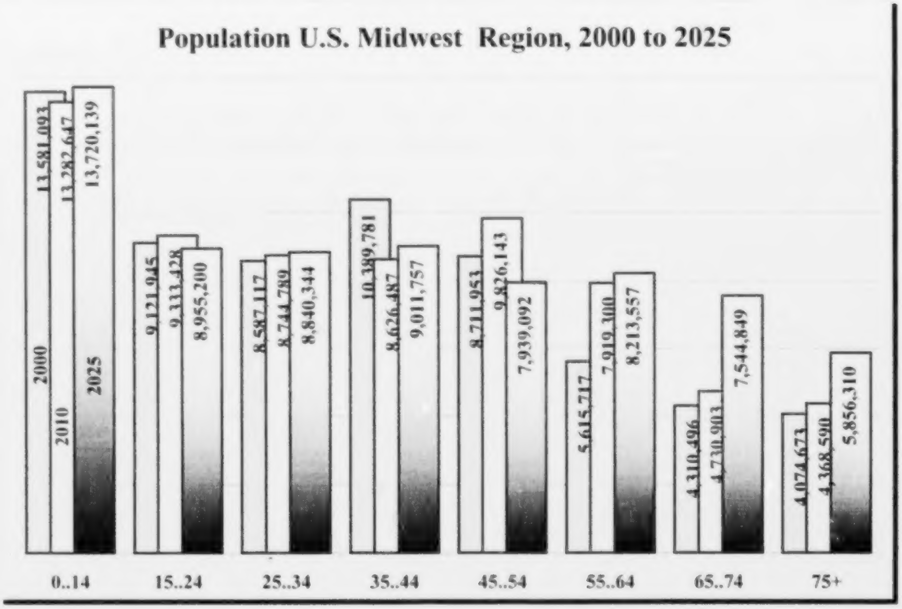


Figure 24

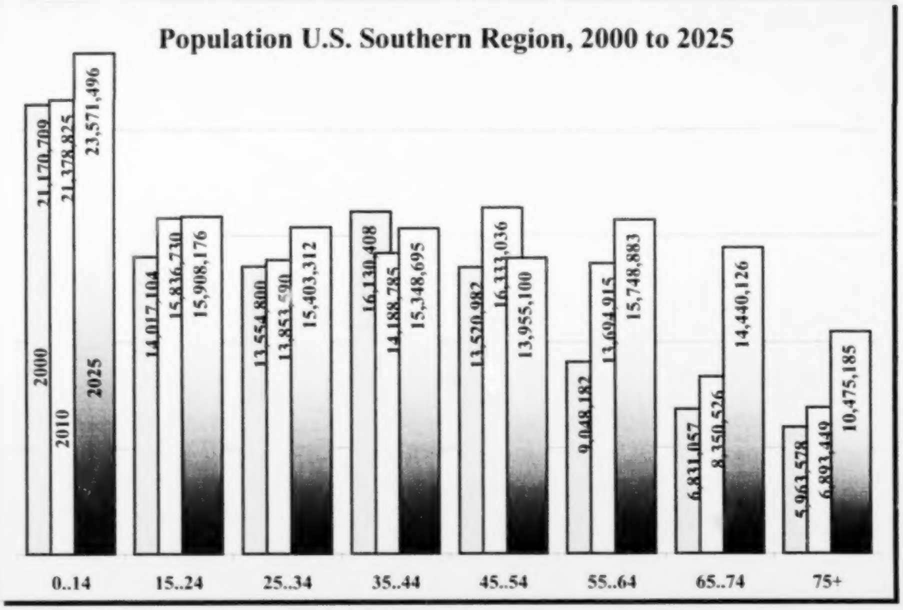
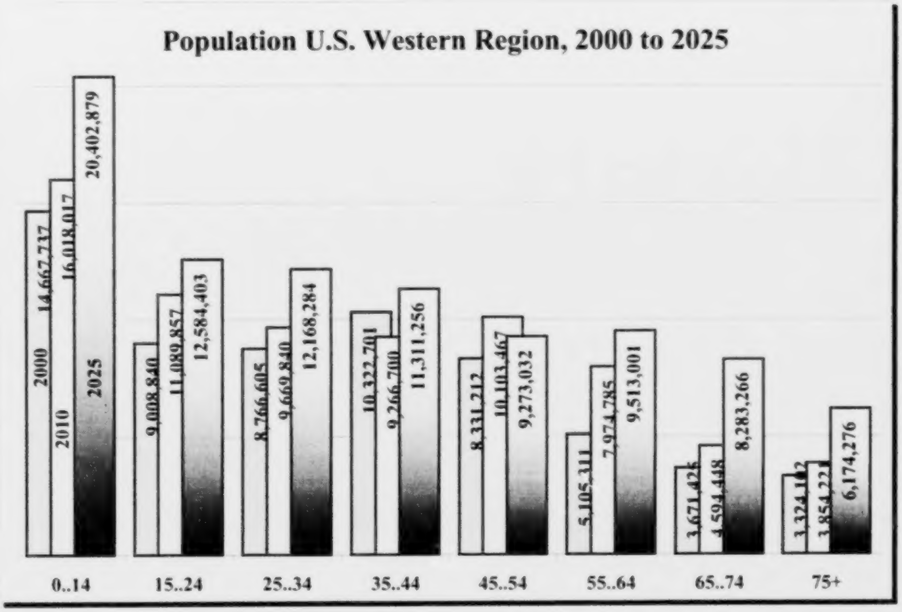


Figure 25

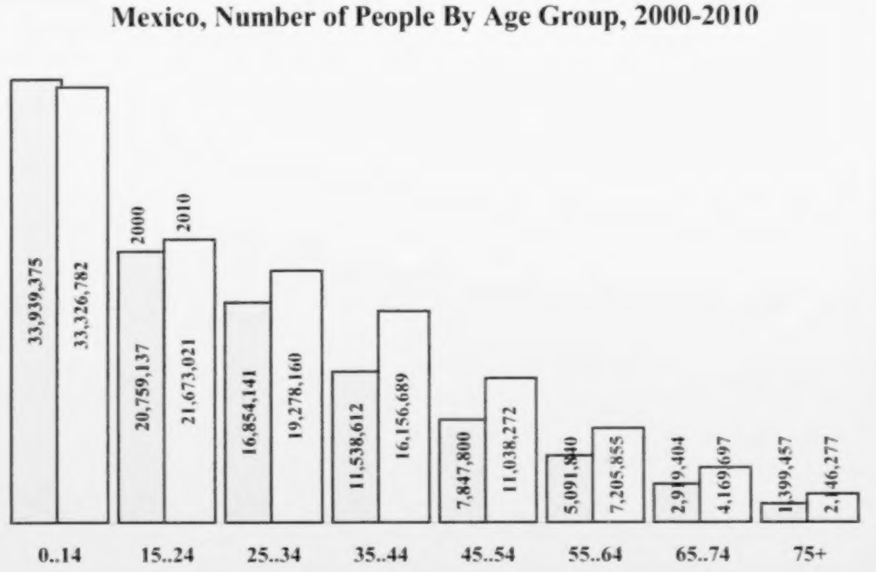


VII. MEXICO

AN INTRODUCTION TO THE DEMOGRAPHICS OF TRIP GENERATION FOR THE SEA TO SKY CORRIDOR

Mexico is included here not because it is currently a major source source of travelers to the Sea to Sky corridor, but rather to indicate it's potential as a source. With slow growth and even decline of population in the traditional long haul traveller markets, it will be necessary to give increasing weight to the demographics of Canada's NAFTA partners in projections of travel demand.

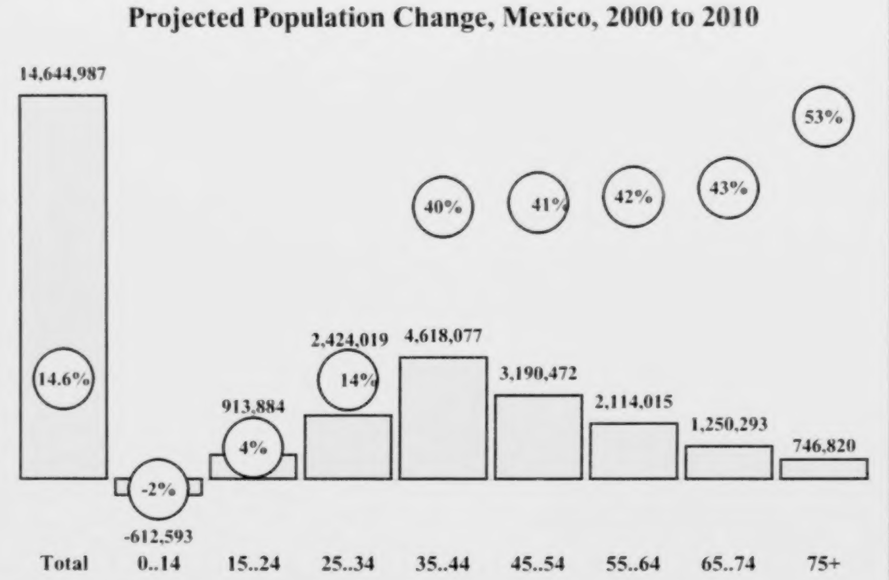
Figure 26



The demographics of Mexico are dramatically different from those of the other regions considered thus far: its population is dominated by its younger age groups, not an aging post World War II baby boom (Figure 26), and it has an above the replacement level birth rate (although the birth rate is approaching replacement level).

The population of Mexico is projected[vii] to grow by 14.6 million people (14 percent) over the next decade, from its 2000 population of 100,349,766 to 114,994,753 in 2010. The largest absolute increase will be in the 35 to 44 age group, which will add 4.6 million people (a 40 percent increase) over the decade (Figure 27). Each of the 45 to 54, 55 to 64 and 65 to 74 age groups will see growth in the range of 40 percent as they grow by 3.2, 2.1 and 1.2 million people respectively. Although the 75 plus age cohort will increase by fewer people than these younger cohorts

Figure 27



(746,000 additional people), it will see a much greater relative increase: between 2000 and 2010 the 75 plus age group is projected to grow by 53 percent, three times the 14.6% increase projected for the total population. The one age group that is projected to decline over this period is the 0 to 14 group. The projected 612,000 person, or 12 percent, decline would be the result of the continuation of the decline in fertility rates that have been experienced over the past decades.

The population of Mexico is projected to increase by 33.4 million people (a 33 percent increase) over the next 25 years, from its 2000 population of 100,349,766 to 133,834,712 in 2025. Again, the aging of its current age structure will mean that change will have a much bigger demographic impact than growth. The greatest absolute growth will be in the 45 to 54 age group which will add 9.4 million (120 percent) more residents. The 35 to 44 and 55 to 64 age groups will each add over 7 million more residents over the next 25 years, resulting in a 67 percent and a 144 percent increase, respectively.

The pattern of relative increases is correlated with increasing age: the 75 plus age group will add 2.8 million residents, resulting in a 198 percent increase. Younger age groups will each experince progressively lower increases, with the 460,000 additional people in the 15 to 24 age group increasing its size by only 2%, and the 2.2 million person decline in the 0 to 14 age group resulting in a 7 percent decline in its size.

Figure 28

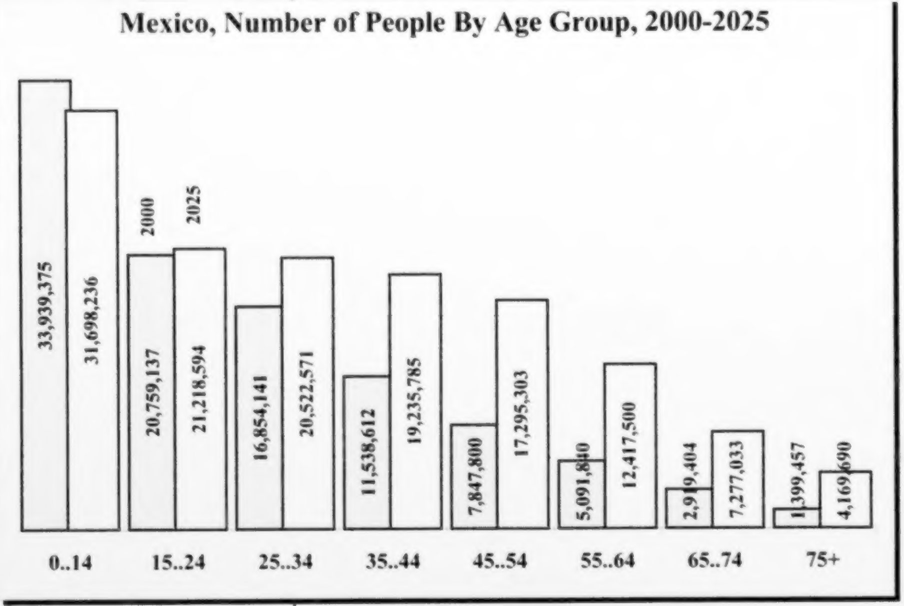
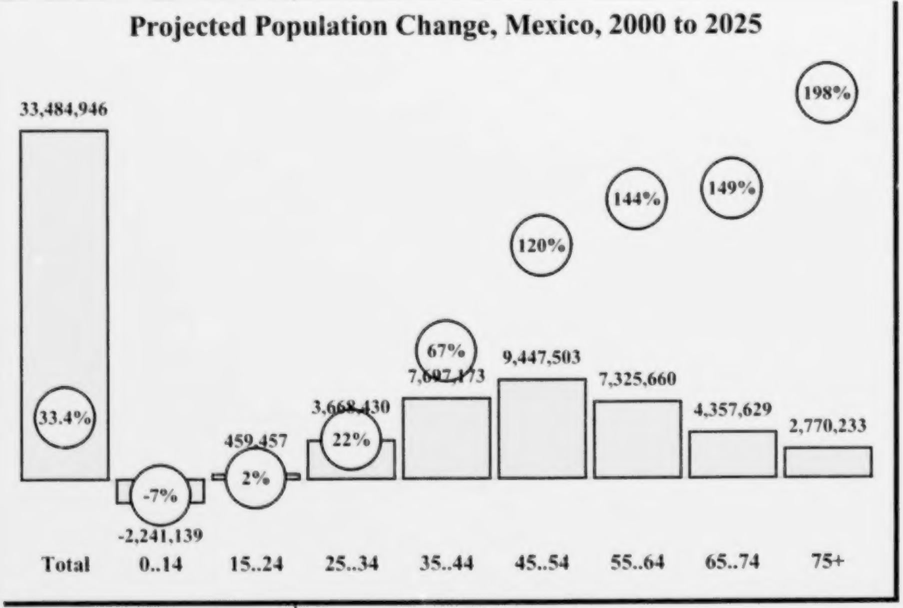


Figure 29



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[i] BC Statistics, PEOPLE 26 Population Projections by Local Health Area, June 2001, data files.

[ii] Statistics Canada, Population Projections for Canada, Provinces and Territories, 2000- 2026 (Statistics Canada, Ottawa, 2001) CDROM.

[iii] Statistics Bureau, Ministry of Public Management, Government of Japan; Ministry of Health, Government of Japan; International Data Base, International Program Centre, US Bureau of the Census

[iv] International Data Base, International Program Centre, US Bureau of the Census

[v] US Bureau of the Census, Population Projections, National and State, Medium Projections

[vi] States in each Region include:

Northeast

Connecticut
Maine
Massachusetts
New Hampshire
New Jersey
New York
Pennsylvania
Rhode Island
Vermont

Midwest

Illinois
Indiana
Iowa
Kansas
Michigan
Minnesota
Missouri
Nebraska
Ohio
South Dakota
Wisconsin

South

Alabama
Arkansas
DC
Delaware
Florida
Georgia
Kentucky
Louisiana
Maryland
Mississippi
North Carolina
Oklahoma
South Carolina
Tennessee
Texas
Virginia
West Virginia

West

Alaska
Arizona
California
Colorado
Hawaii
Idaho
Montana
Nevada
New Mexico
North Dakota
Oregon
Utah
Washington
Wyoming

[vii] Instituto Nacional De Estradistica, Geograpfia, e Informatica, Government of Mexico; International Data Base, International Program Centre, US Bureau of the Census

Appendix E – Latent Travel Demand

Latent travel demand refers to increases in daily travel due to expansion of person capacity on a corridor or facility. Latent demand does not refer to behaviour modification of trips that are being generated such as changes in trip start time, route diversion or mode.

It is important to distinguish latent demand from other determinants of increased travel. The key to success in identifying induced or latent demand is to avoid attributing growth induced by other causal factors such as changes in the number of trip makers and their characteristics (income, employment status, age) and other exogenous factors such as gasoline price to highway capacity expansion. A number of studies that have tried to isolate induced demand within an urban context have concluded that "the vast majority of VMT (VkT) growth is directly related to factors other than changes in the highway system"[8]. Luk and Chung[9] concluded that the release of latent demand due to capacity expansion is possible, but is closely related to existing congestion and demographic factors. Dowling and Coleman[10] estimated the effect on trip making behaviour due to increased highway capacity. Their household survey estimated that, depending upon the level of time savings, highway capacity expansion can be expected to increase demand by three to five percent (within an urban area).

It does not appear that previous empirical analysis of induced demand on inter-city corridors is readily available. In this context, the Sea-to-Sky corridor can be considered unique because a large proportion of trip purposes are related to recreational trips; and because of safety concerns. Therefore, it may reasonable to anticipate latent demand effects that are higher than in an urban context.

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[8] Heanue, Kevin. Highway Capacity and Induced Travel: Issues, Evidence and Implications. Highway Capacity and Induced Travel: Issues, Evidence and Implications. FHWA, 1998.

[9] Luk, James and Edward Chung. Induced Demand and Road Investment – An Initial Appraisal. Australian Research Record 299. February, 1997.

[10] Dowling, Richard and Steven Coleman. Effects of Increased Highway Capacity: Results of a Household Travel Behaviour Survey. Transportation Research Record 1493.